KOOTENAI DEVELOPMENT IMPOUNDMENT DAM

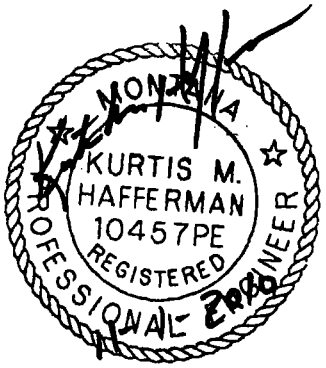
SEPTEMBER 2010 ROUTINE OWNERS INSPECTION

Prepared for: The Remedium Group

Prepared by: Kurt Hafferman, P.E.

BILLMAYER & HAFFERMAN INC.
2191 3rd Avenue East
Kalispell, Montana 59903

Inspection Date: September 28th, 2010
Report Date: October 22nd, 2010



INSPECTION DATE: **September 28th, 2010**
REFERENCE: **SEPTEMBER 2010 ROUNTINE OWNERS INSPECTION**

OBJECTIVES

The end of September 2010 routine owner's inspection was conducted on Tuesday September 28th, 2010. Personnel included Dan Nelson from BHI and Jeremy Peterson from Chapman Construction.

The inspection was conducted as a routine owner's inspection. Project tasks to be completed included:

1. Safety meeting with Chapman and BHI
2. Check Fleetwood Creek and Upper Rainy Creek inflows
3. Read reservoir level
4. Inspect the embankment dam
5. Inspect principal spillway
6. Inspect outside and inside of drains
7. Read flumes and weirs below the drain outlets.
8. Read staff gauges in all streams above and below drain outlet channel.
9. Fix LRC-01 flume in Lower Rainy Creek and read new level
10. Decontaminate and depart site

RESULTS

The routine owner's inspection began at 9:30 a.m. and ran until 1:30 p.m. The weather was partly cloudy and calm. The temperature ranged between 53° and 72°. There was significant rainfall early last week. There were no weather or equipment impediments that affected the inspection. Copies of photographs from the date of the inspection are included in Appendix 1.

Copies of the Routine Owners Inspection Report as filled out after the inspection and copies of the field notes are provided in Appendix 2. The following are the results of each of the ten (10) tasks above;

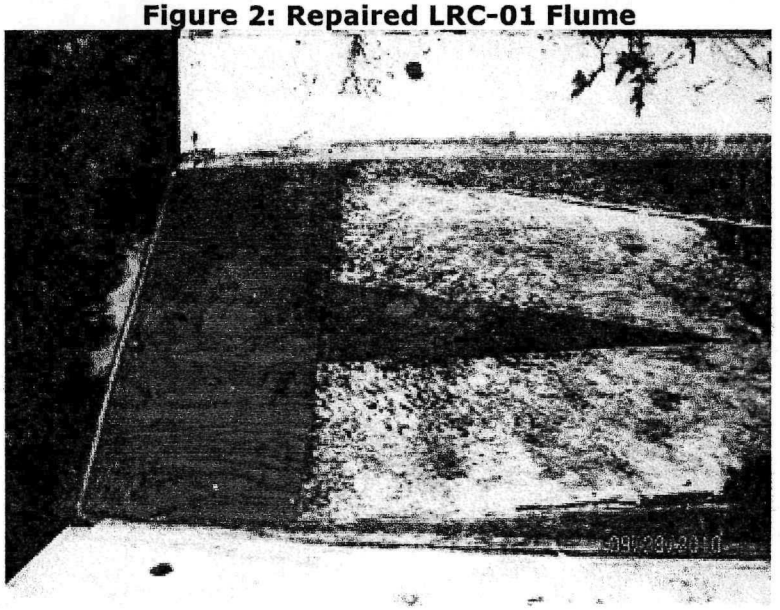
1. Safety Meeting: Jeremy Peterson is assigned as the health and safety officer and is responsible for equipment condition, decontamination procedures, and over all KDID site safety. The safety meeting with Chapman Construction's Jeremy included discussion of the work tasks and procedures for the day, haul road safety, and overall job site safety. We do not anticipate heat to be a problem today due to cooler temperatures. Tool safety and work speed was also discussed as the LCR-01 flume will be fixed today. Tasks for this project included removing damaged pieces from the flume, measuring and cutting replacement materials and installing on the existing flume in place. Equipment was checked and no issues were found. Standard equipment used included: double Tyvek suits, rubber booties, double vinyl gloves, and North® full face mask. Booties were taped at the top and Tyvek suits are taped at the zipper on the outer suit.

2. Fleetwood Creek and Upper Rainy Creek were checked and URC02 flume was read. The flow in Upper Rainy Creek has increased.
    a. The H-Flume gauge height reading in Fleetwood Creek was taken. The gauge height was 0.10 ft. at Fleetwood Creek which is approximately 11.13 gpm.
3. The reservoir level was below the gauge. The level is estimated to be 0.02 ft., down 0.11 ft. from last month or a decrease of 0.3 acre-feet. The reservoir level had increased through March and April and was receding in May. With the rains in May and June, the reservoir rose again in June. The rise was sudden and has now stabilized to below average levels as expected due to precipitation levels this year. An update of the pieziometer plots is included.
4. No bulges, erosion or other anomalies or changes were noted on the embankment from the upstream face to the toe.
5. No water has run in the spillway this year and no water is expected for the remainder of the year. There is minor debri accumulation in the spillway.
6. Drains were inspected and the flow in the drains and stream channel below the drains were recorded. Flows in Drain 6, and the flume for Drains 7/8 increased slightly. Seepage was noted below drain 7, but was less than last month. All drain flows were clear and steady.
7. All weirs and drains were read, no anomalies were found. Results are shown in Table 1 below.
8. Gauge height readings from the flumes and weirs instream and below the toe drains were taken. Rainy Creek streamflow included URC02, LRC01, LRC02, CC02, and LRC06 flumes. Results are shown in Table 1 below.
9. The LRC-01 flume was repaired from the moose damage that occurred earlier this year. Readings were taken before and after the repair. The reading before the repair was 0.55 ft. and was 0.66 ft. after the repair. The flow is expected to rise even more in the short term as the flows stabilize behind the flume. Due to the reconstruction of the flume, a new height to flow conversion chart will need to be created.

    To repair the flume, a 4ft. x 4ft. sheet of ½" waterproof plywood and four, 4ft. pressure treated 2x6's were hauled onsite. An additional 8ft 2x6 was brought along just in case. Battery powered tools were brought along to facilitate repairs. The first step was to remove damaged materials from the flume and measure for the new pieces. Measurements were taken and pieces marked for cutting. It didn't take long to realize the 5 batteries would not cut all the pieces so Jeremy departed the site for additional hand tools to speed the process. I marked the remaining pieces and was able to cut the plywood before Jeremy returned. The 2x6's were then cut to support the plywood. The pieces were then assembled onto the existing flume with screws to complete the repair. See Figures 1 and 2 below for before and after photos of the Flume.

Figure 1: Damaged LRC-01 Flume

Figure 2: Repaired LRC-01 Flume



10. Decontamination was conducted at the amphitheater using ER pressure washing equipment.

The readings from all of the inflow and outflow streams, including the flumes, weirs, and reservoir levels are shown in Table 1 below. Table 2 shows the net difference between inflows and outflows on the day of the inspection.

Table 1: Flow Measurement Results

Station	GH Reading (ft.)GH Reading Last Month	GH Reading (ft.)GH Reading this Month	GH Reading Difference from Last Month	Flow (gpm)/VOL (AF) Last Month	Flow (gpm)/ VOL (AF) This Month	Flow/VOL Difference from last month	Temp °F
URC02	0.240	0.305	+0.065	53.6 gpm	84.8 gpm	+31.2 gpm	46°
Fleetwood Creek	0.12	0.10	-0.02	15.3 gpm	11.13 gpm	-4.17 gpm	48°
Reservoir	0.13	0.02	-0.11	13.3 AF	13.0 AF	-0.30 AF	58°
F 1-2-3-4	0.16	0.14	-0.02	16.5 gpm	12.7 gpm	-3.8 gpm	51°
W 5	0.040	0.031	-0.009	0.38 gpm	0.20 gpm	-0.18 gpm	
D6	0.948	0.937	+0.011	99.2 gpm	119.03 gpm	+19.8 gpm	50°
F 7-8	0.10	0.13	+0.03	4.53 gpm	7.76 gpm	+3.23 gpm	49°
W 12	0.21	0.198	-0.012	23.3 gpm	20.14 gpm	-3.16 gpm	51°
F -Seep	0.15	0.14	-.01	22.7 gpm	20.1 gpm	-2.6 gpm	48°
LRC01		0.66		325 gpm	161 gpm*		
CC02	0.126	0.15	+0.024	60.7 gpm	91.57 gpm	+30.9 gpm	50°
LRC02	0.339	0.31	-0.029	332 gpm	289 gpm	-43 gpm	
LRC06	0.375	0.38	+0.005	388 gpm	396 gpm	+8.0 gpm	52°

*Flume repairs, flow estimated

Table 2: Total Flows

Total Flows	
Inflows Above Reservoir at URC02 + Fleetwood Creek	95.93 gpm
Outflow Below Reservoir above CC02	197.43 gpm
Difference	(-) 101.5 gpm

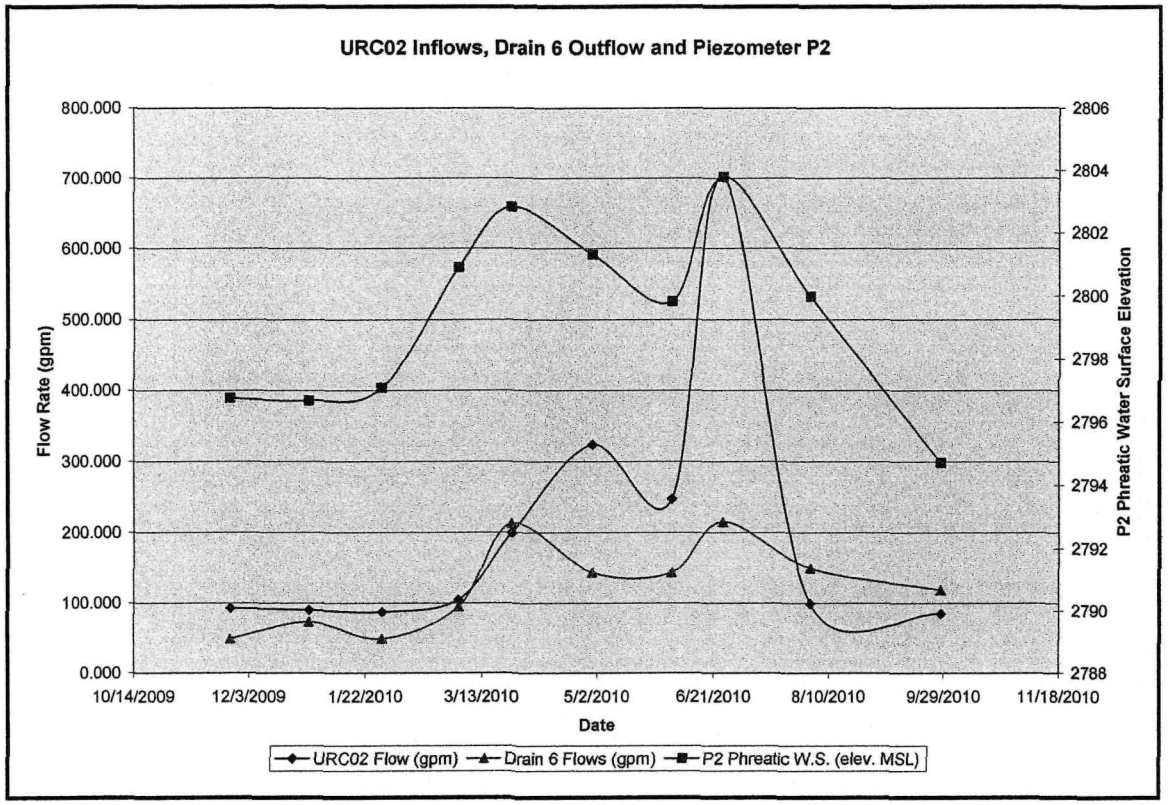
DISCUSSION

In general inflows, reservoir levels, drain outflows and lower Rainy Creek flows are stable. The inflows Increased from 68.9 gpm to 95.93 gpm, an increase of 27.03 gpm or 28% from the end of August to the end of September. The weather has been warm with significant rainfall in the last 2 weeks. The precipitation in this area as of September 30, 2010 is 83% of normal at Banfield Mountain site which is just northwest of the project, so the overall year is still slightly dryer than normal which shows in the reservoir levels recorded this year.

Drain 6, the main drain at the toe, increased flow from 99.2 gpm to 119.03 gpm, an increase of 19.83 gpm, or 17% since last months measurements. It is interesting to note the correlation between Rainy Creek/Fleetwood Creek inflows to the reservoir and the response in flows in drain 6. Once again we see a rise in inflows and a rise in drain 6. As expected the correlation between reservoir inflow from Rainy creek and Fleetwood creek and outflow through drain 6 has stabilized.

A graph of the inflows and drain 6 flows from November 25th of 2009 to this inspection on September 28th of 2010 is shown in Figure 3.

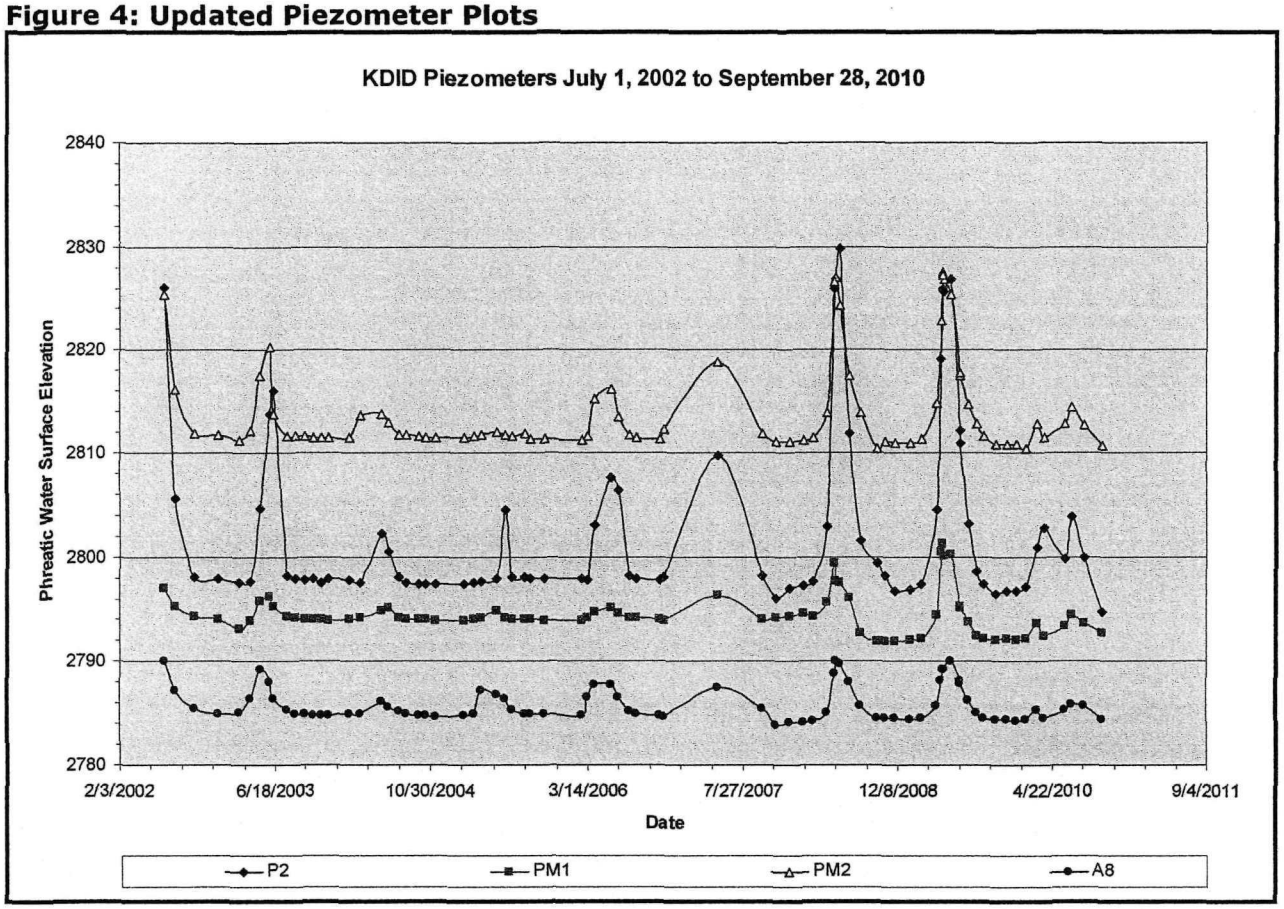
Figure 3: Upper Rainy Creek Inflows and Drain 6 Outflow 11/25/2009 to 9/28/2010



Although it is recognized that the frequency of water level readings, e.g., monthly, can make the points on the graph match other hydrologic events, it is clear that the shape of the curves, particularly during rapid increase and decrease in flow, and the time sequence to rises in flows, is more than coincidental. This type of evidence clearly indicates the close connection that drain 6 and the cross drain system have to the inflows.

The piezometer and drain flow data has been updated and the new data sheets and newly updated graphs are attached to this report in Appendix 3. A copy of the piezometer graph is shown in Figure 4 below;

Figure 4: Updated Piezometer Plots



The graph above shows the rise that occurred in late April which was followed by a decline in May and then another rise in late June and then the fall beginning in July. This graph shows that highest phreatic water surface in the piezometers only rose to the levels such as those seen in 2003 or 2004.

It is interesting to note the current level of Piezometer P2. The water level encountered on this inspection is slightly lower than the previously considered bottom of hole. Previous inspection data is being compiled on Piezometer bottoms to determine any impacts on the dam not previously seen. Further data may be compiled during next months inspection.

Once again we note the close correlation to inflows, phreatic water surface and outflows. It is interesting to note the lag time between inflows from Upper Rainy Creek and piezometer P2 that occurred in the spring is approximately 15 days. Yet there is nearly an instant correlation between rise and fall in late June.

It appears that lag time between inflows and phreatic water surface may be longer in the spring during normal high inflows when water surface is steadily rising but reacts

almost immediately to sudden inflows when the phreatic water surface is low and inflows are falling.

When combined with the data that indicates that drain 6 did not track as closely as the inflows and phreatic water surface, it is suspected that this indicates that there is a limit to the capacity in drain 6 combined. It is also suspected that there is also some storage and therefore routing capacity in the embankment. This data would indicate that there is a rapid response between inflows and drain flows and that not all of the routing and storage capacity occurs in the tailings and water is first routed to and stored in the embankment and then backs up into the reservoir tailings.

HAZWOPER UPDATES

We continue to conduct safety meetings at the beginning of each inspection. All personnel have current certifications, equipment is in good condition, and we have no personnel issues.

The 4x4 and all the equipment was washed with water from the pressure washer. Outside Tyvek suits and booties were removed at the contamination reduction area and we proceeded to the support trailer to complete the decontamination and depart.

CONCLUSION

No significant anomalies or changes were noted.

All elements inspected show no issue or concerns this month that have not already been addressed. Inflows and reservoir levels were low to very low this year. The lag time between inflows, phreatic water surface and outflows appear to be influenced mostly by drain 6 capacity although we suspect there is some storage/routing capacity in the embankment.

RECOMMENDATIONS

1. **Install strain gauge in box culvert.** As we have discussed in previous reports, we continue to monitor the crack in the floor and ceiling of the box culvert. In order to track the changes in the width of the ceiling crack a strain gauge should be installed in the section of the crack that is the largest.

2. **Check depths to bottom of all Piezometers.** As we have discussed in this report the water level detected in Piezometer P2 has prompted the review of previous inspection data to check for anomalies in bottom of hole readings. Current readings should be taken next month to add to the data being compiled.

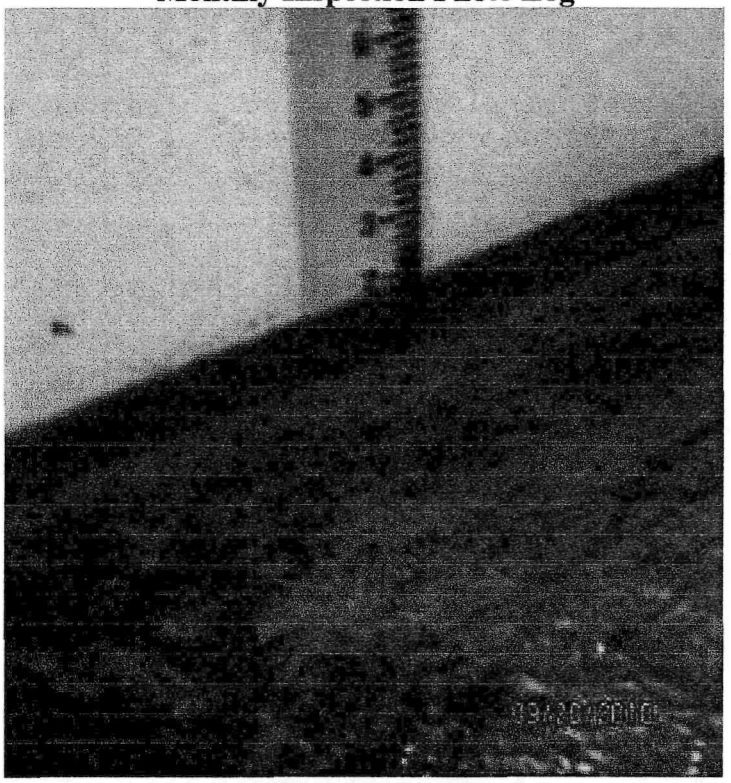
APPENDIX 1

SITE PHOTOGRAPHS

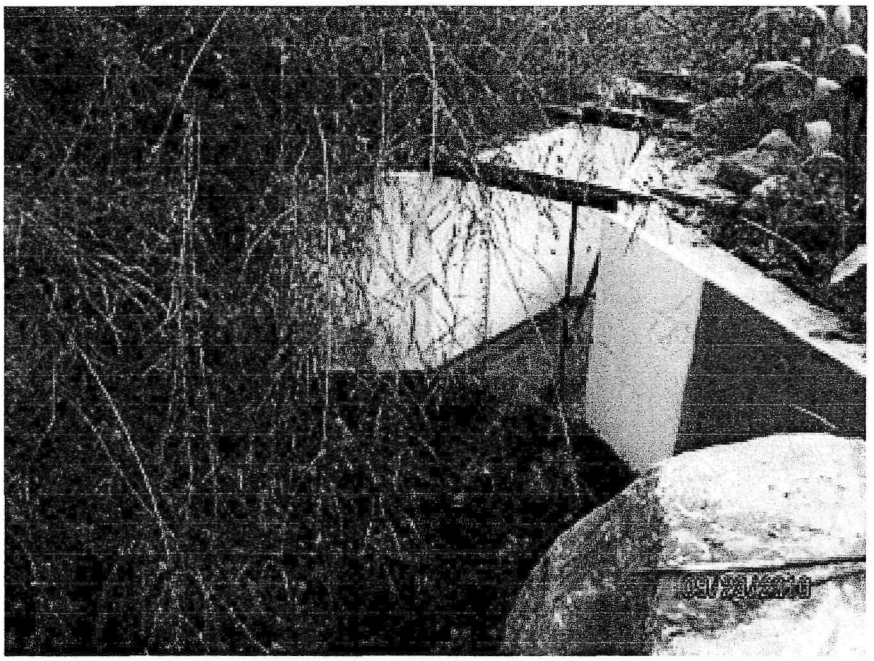
BH BILLMAYER & HAFFERMAN, INC.

September 28th, 2010

Kootenai Impoundment Dam
Monthly Inspection Photo Log



CC-02 Gauge Height



CC-02 Flume looking downstream

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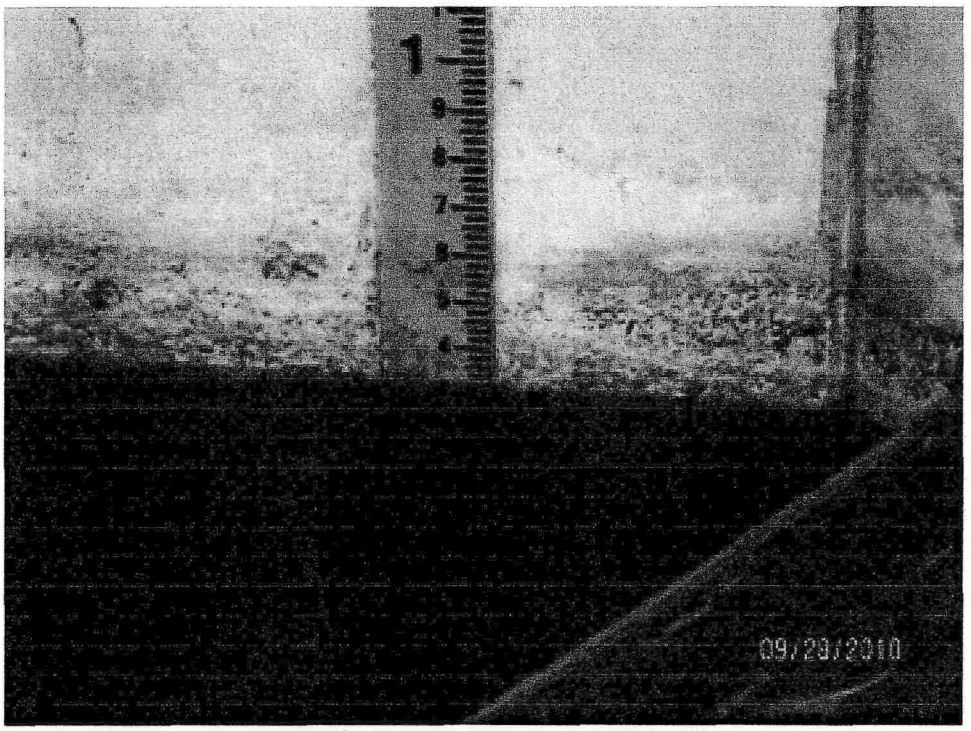
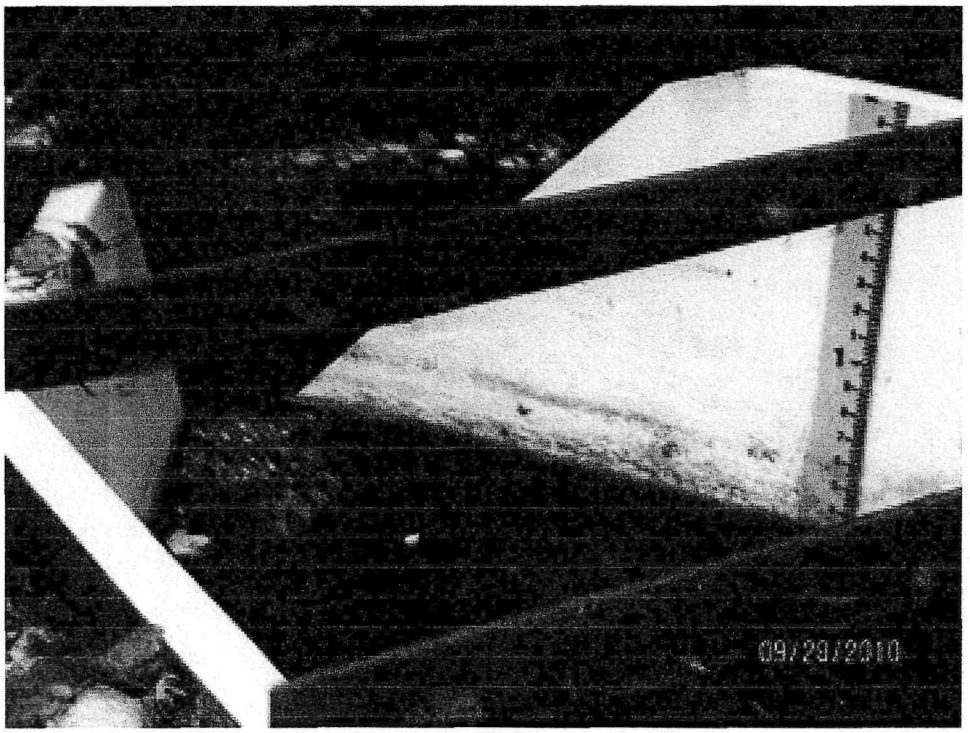
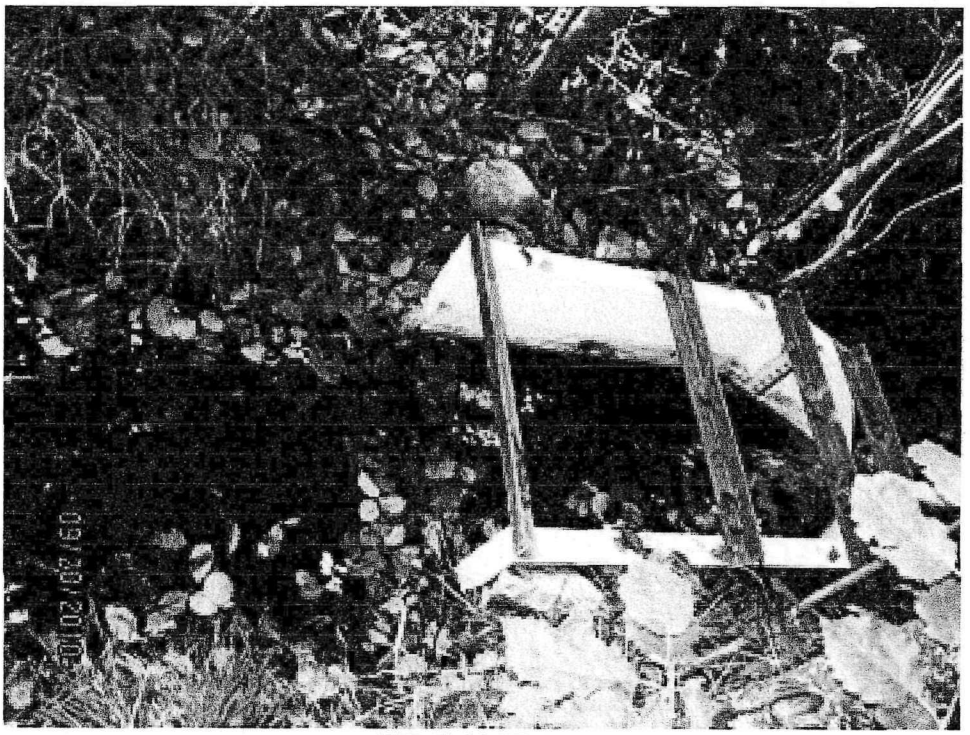


Fleetwood Creek Gauge Height



Fleetwood Creek Flume Outlet

URC-02 Gauge Height



URC-02 Flume

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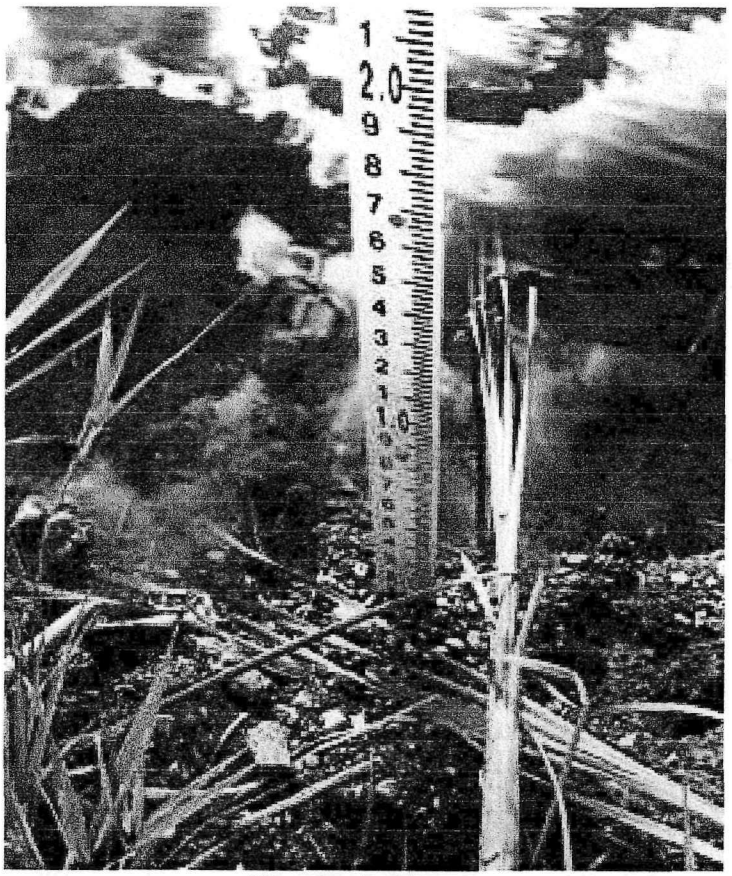

Reservoir Gauge

Looking out over Reservoir

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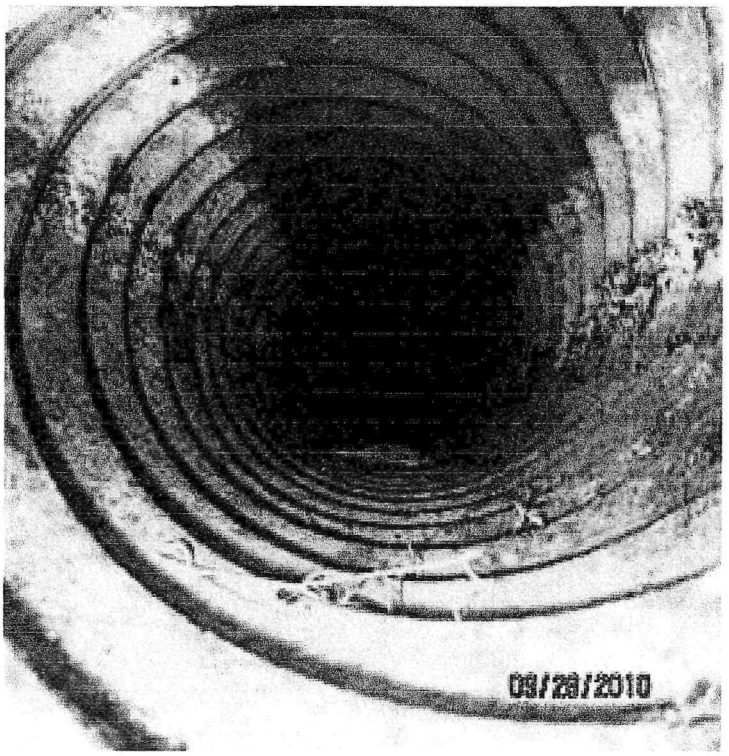
Crest of Dam – Upstream side looking Right

Upstream Face of Dam looking Left from Piezometer P3

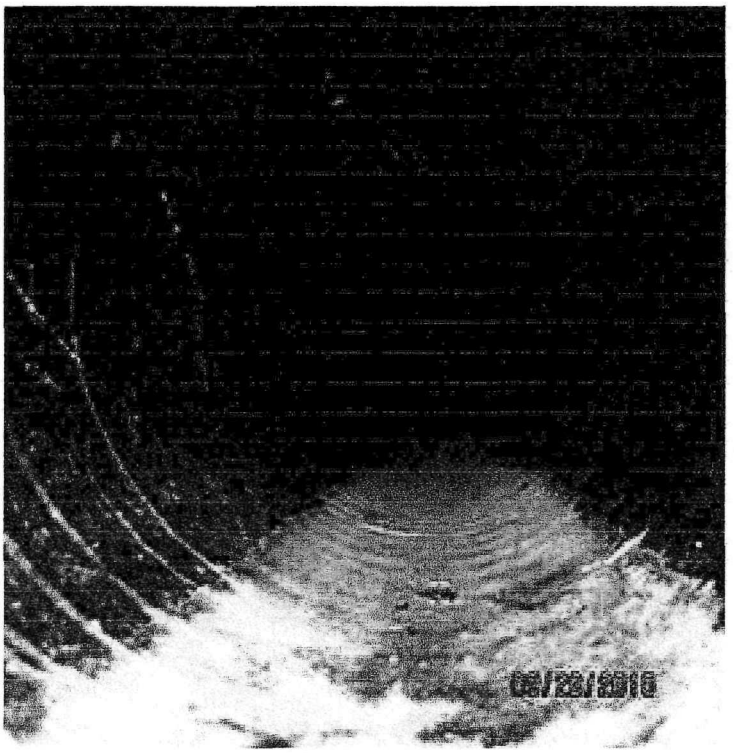
Downstream Face of Dam looking at Right Abutment

Downstream Face of Dam looking at Left Abutment

Toe Drains 1 and 2



Looking up Drain 1



Looking up Drain 2

Culvert from Toe Drains 1 and 2

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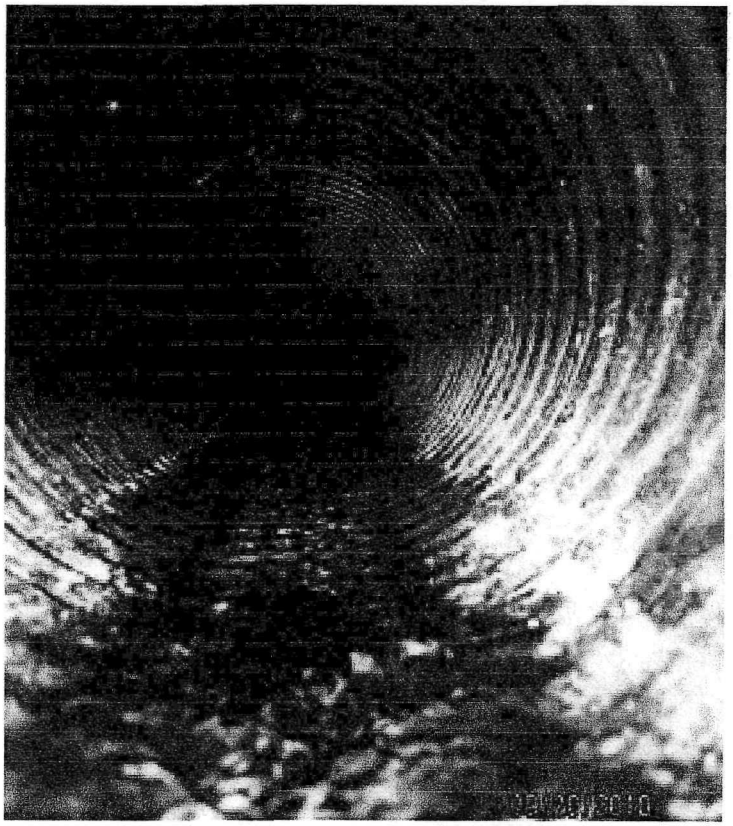
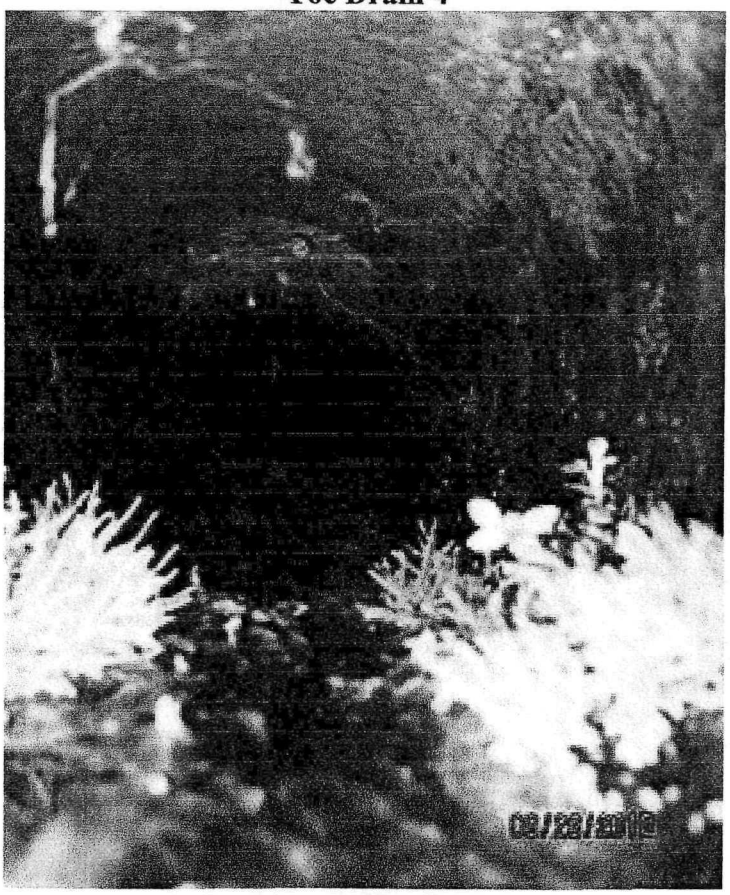
Toe Drain 3



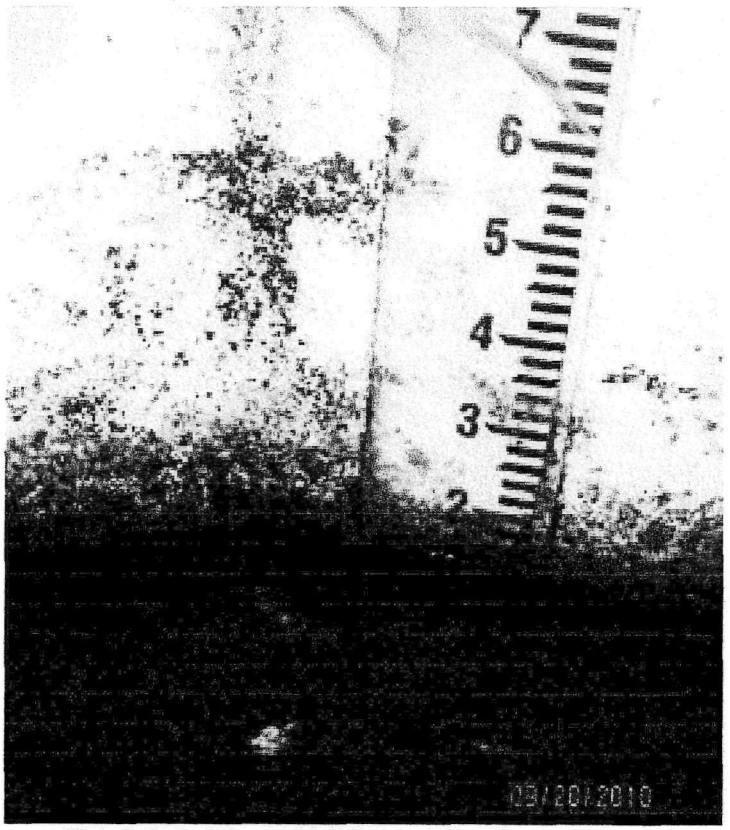
Looking up Toe Drain 3

Toe Drain 4

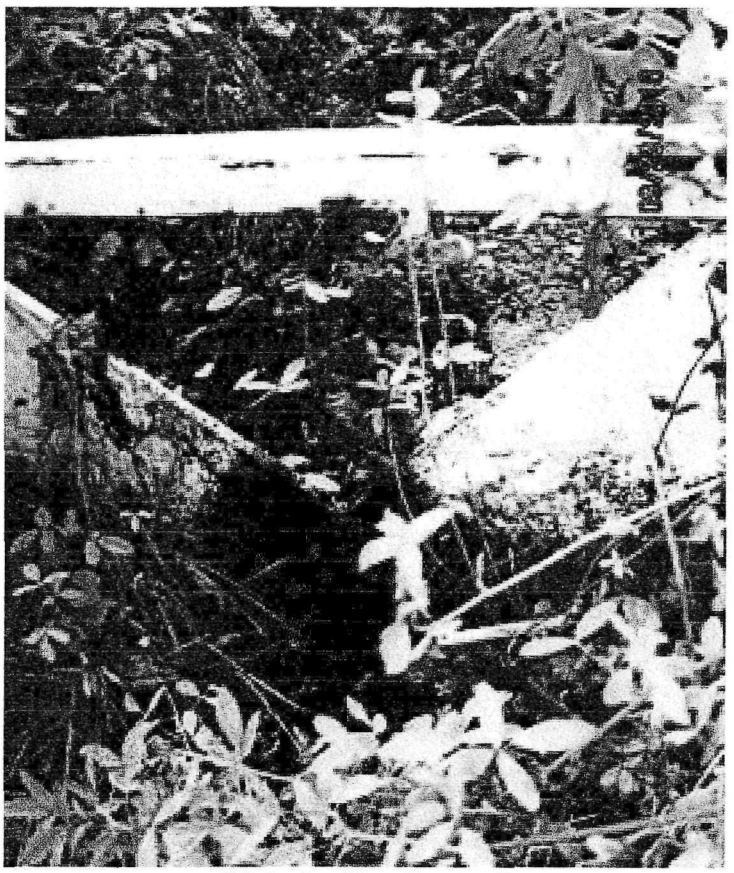


Looking up Toe Drain 4

Flume 1-2-3-4 for Toe Drains 1 – 4

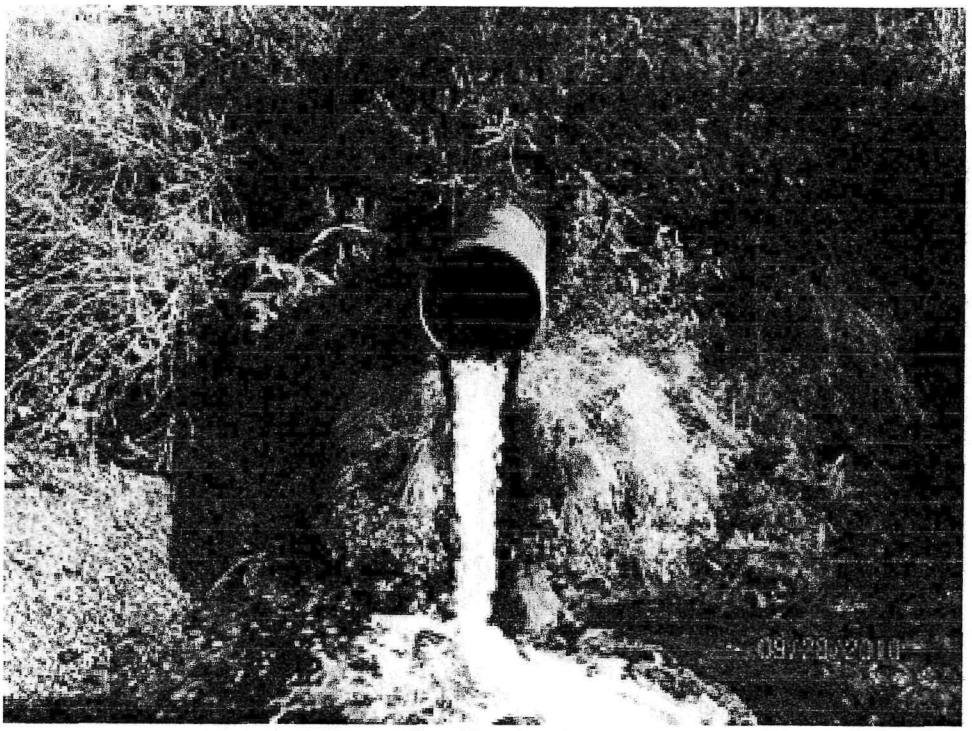


F 1-2-3-4 Gauge height for Toe Drains 1 – 4



Weir for Toe Drain 5

Looking out towards Toe Drain 6



Toe Drain 6

Looking up Toe Drain 6

Toe Drain 7

Toe Drain 7 Close up

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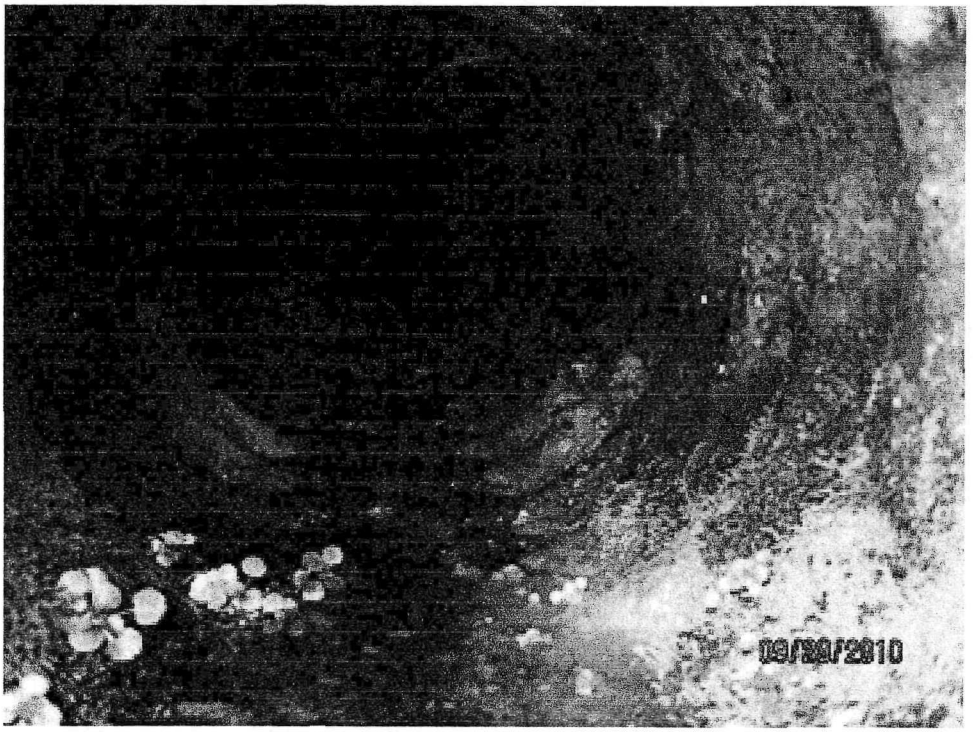
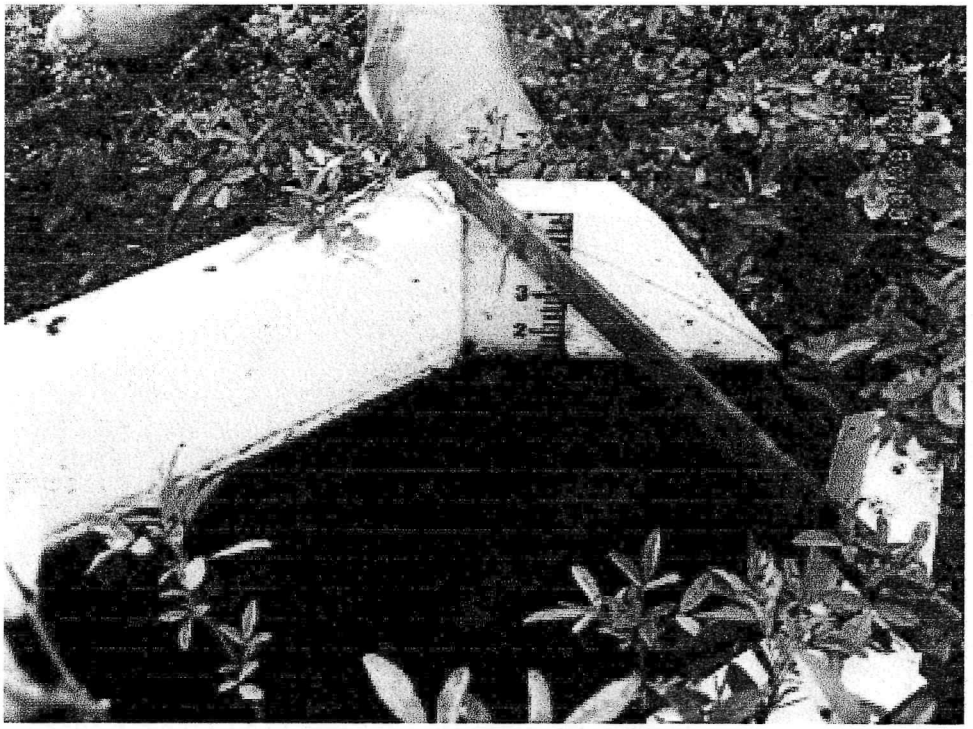
Toe Drain 8

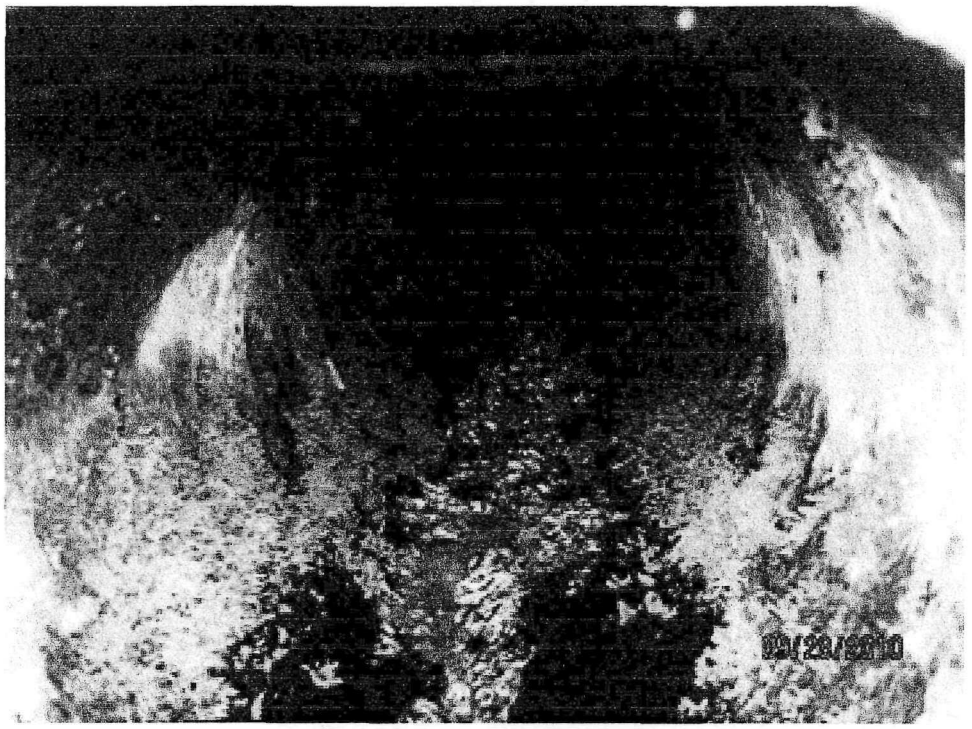


Looking up Toe Drain 8



Flume 7-8 Gauge Height

Toe Drain 9



Looking up Toe Drain 9

Looking up Toe Drain 10

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Toe Drain 11

Toe Drain 12

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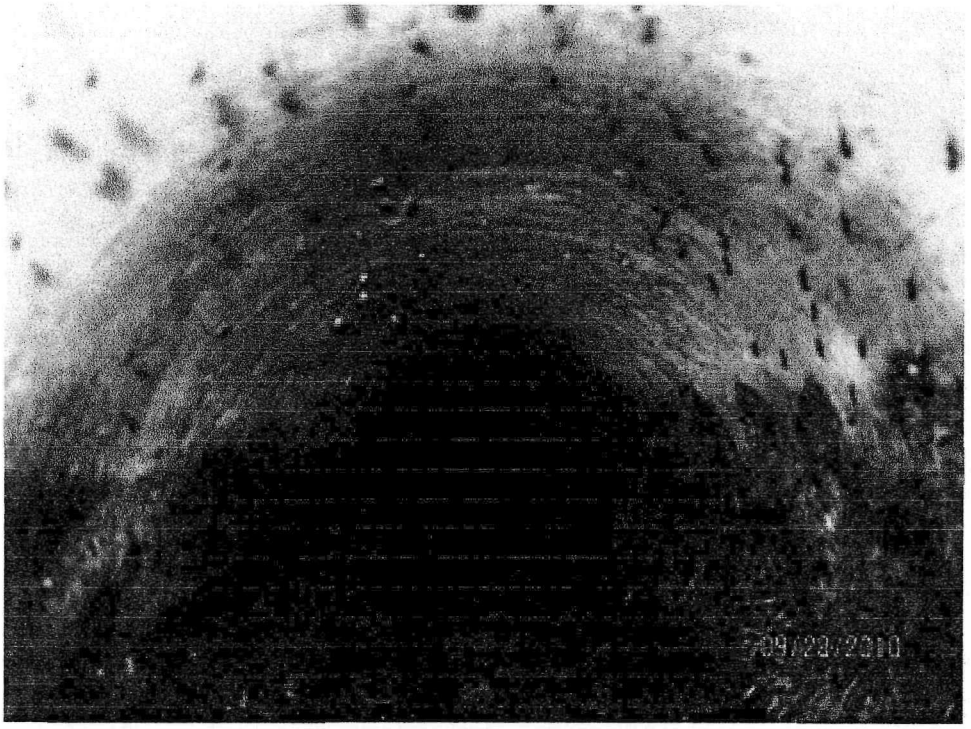
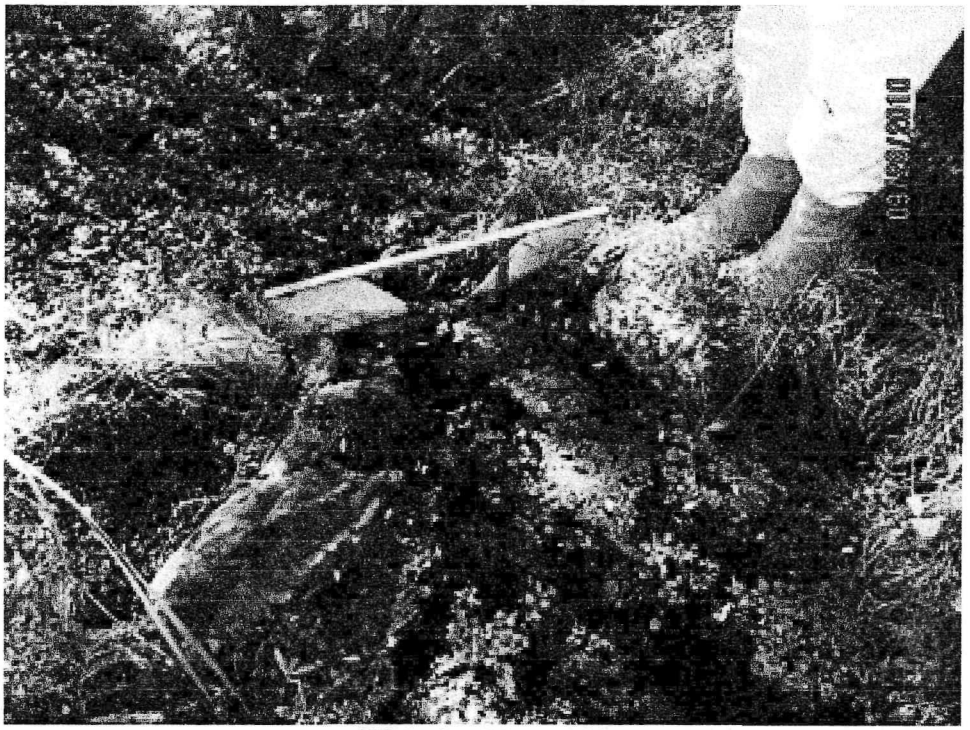
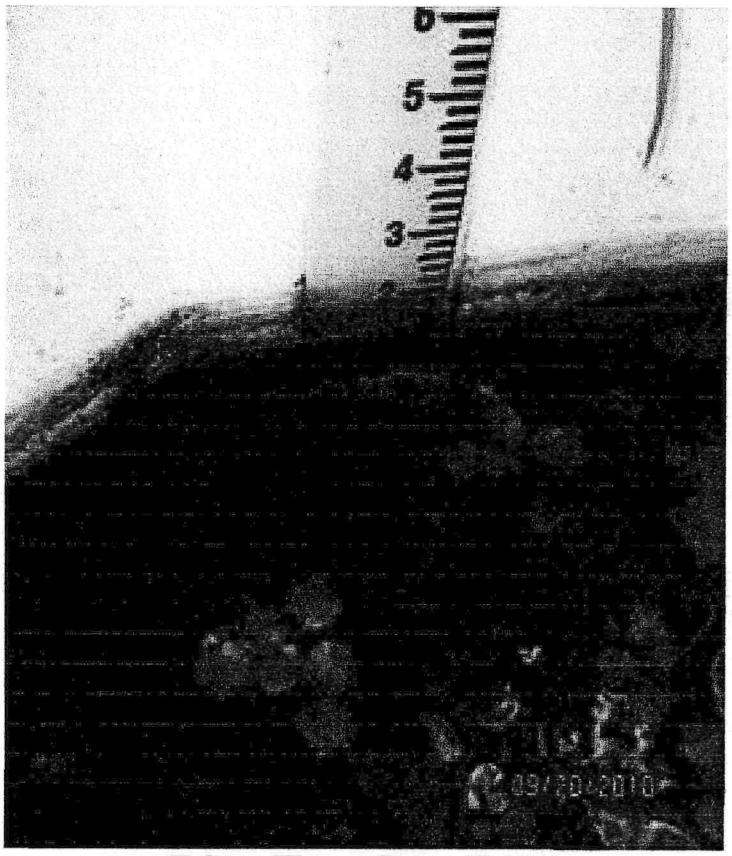


Looking up Toe Drain 12



Weir for Flume 12

F-Seep Flume



F-Seep Flume Gauge Height

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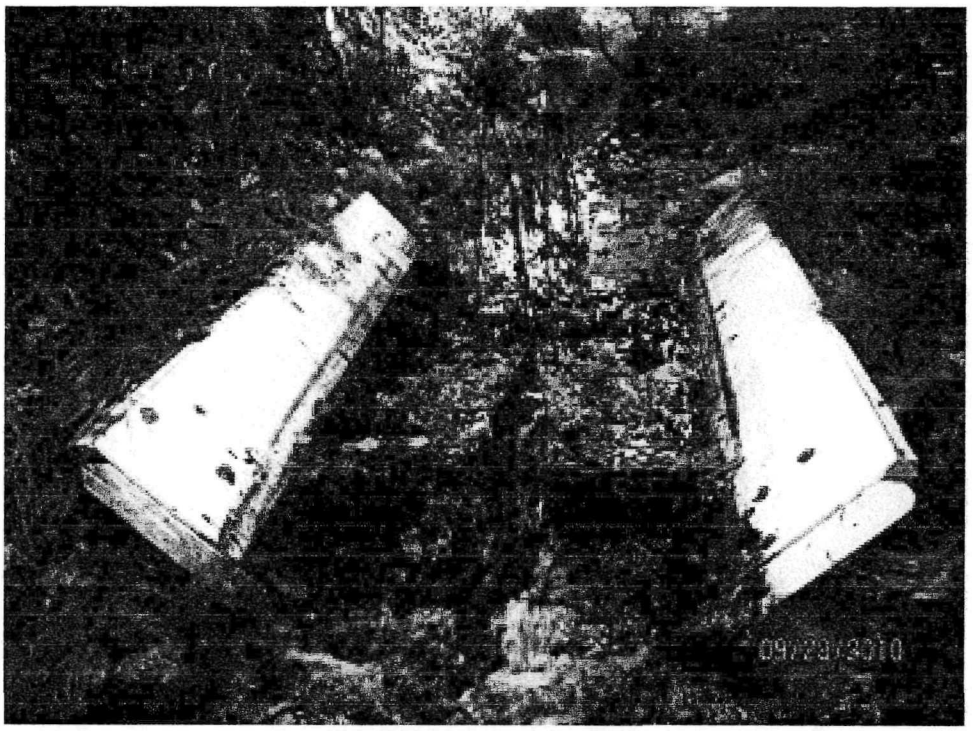

LRC-01 Before Repair

LRC-01 Pre-repair Gauge Height

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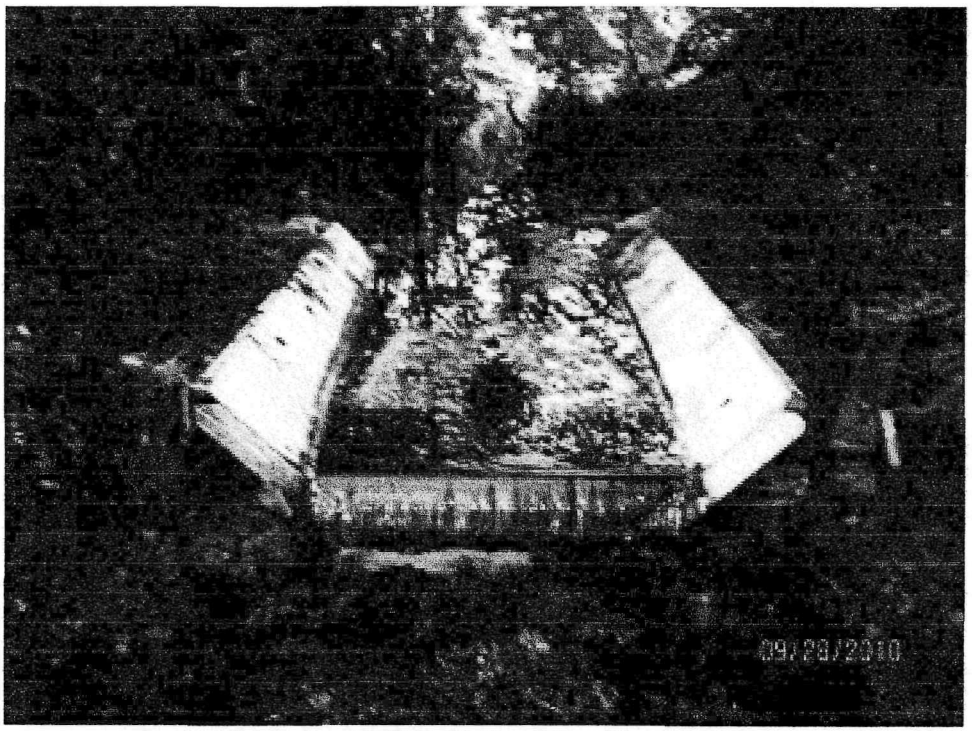
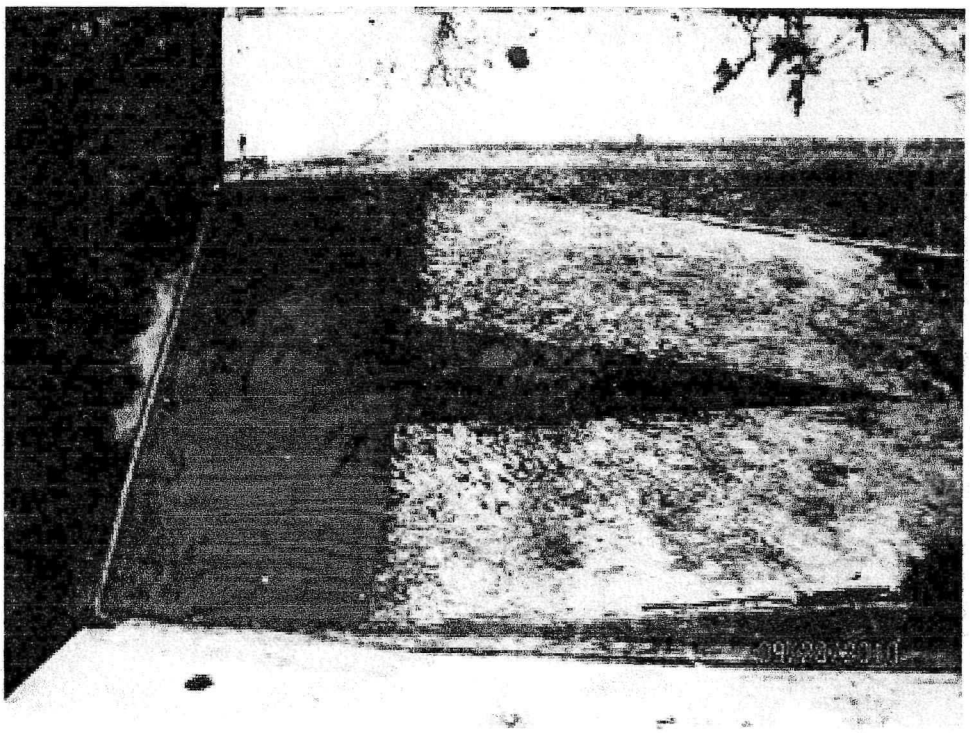
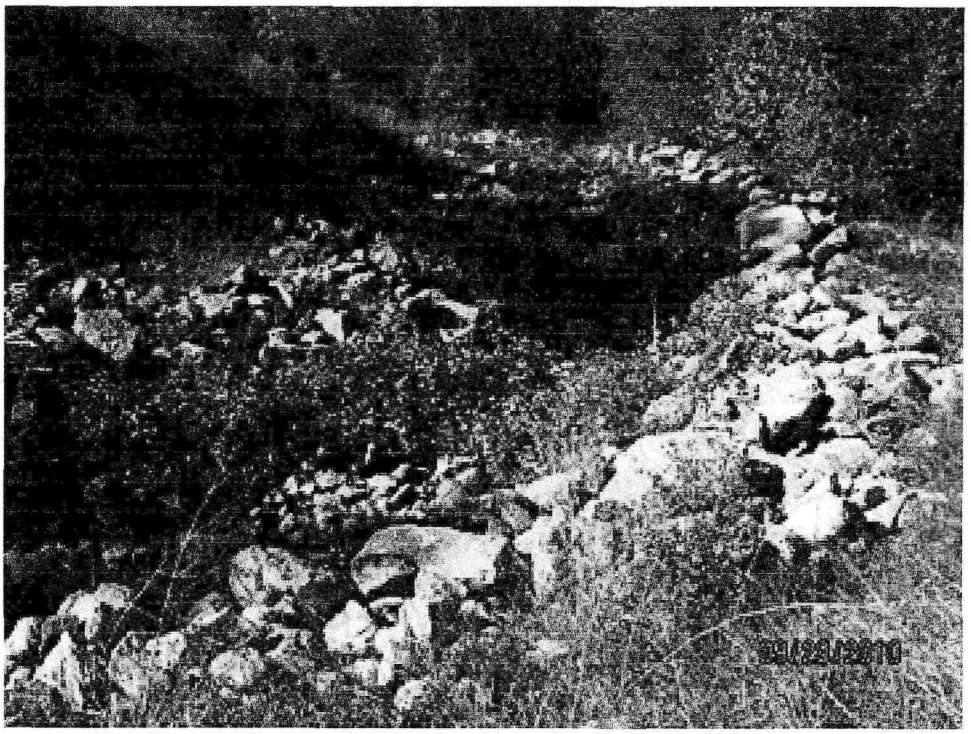


Repaired LRC-01 Looking Upstream

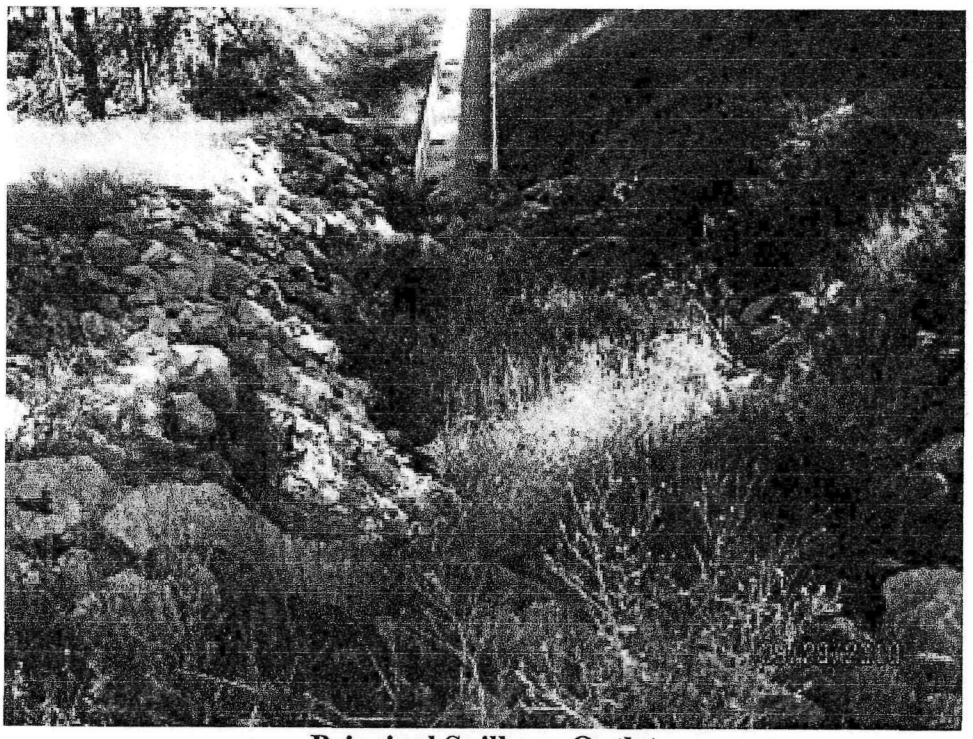


LRC-01 Completed Repair

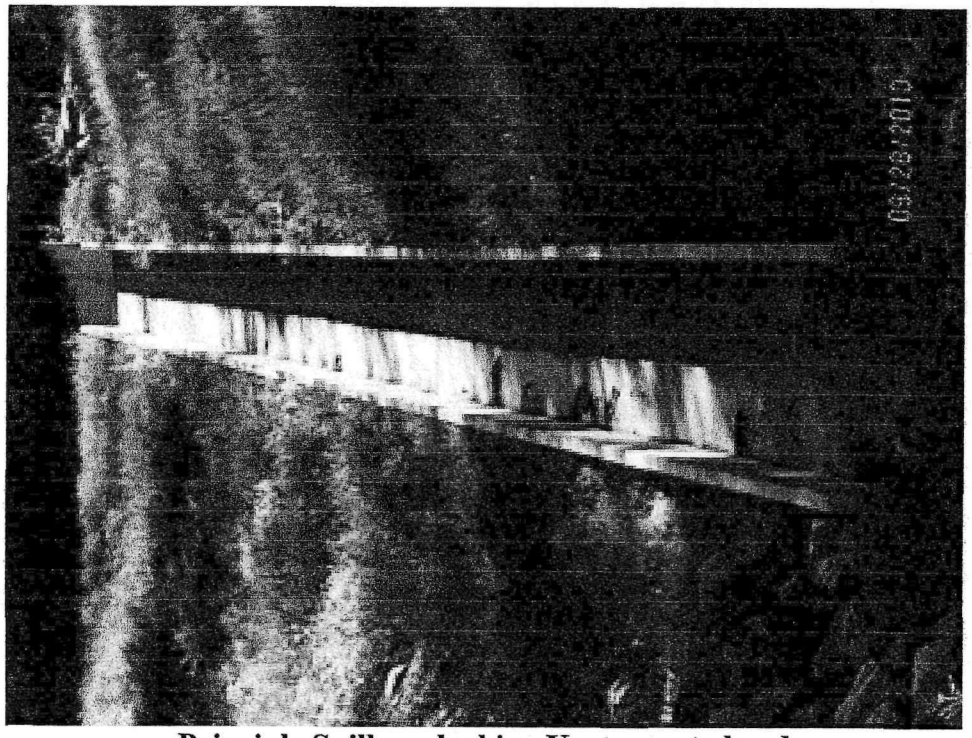
LRC-01 Gauge Height after Repair



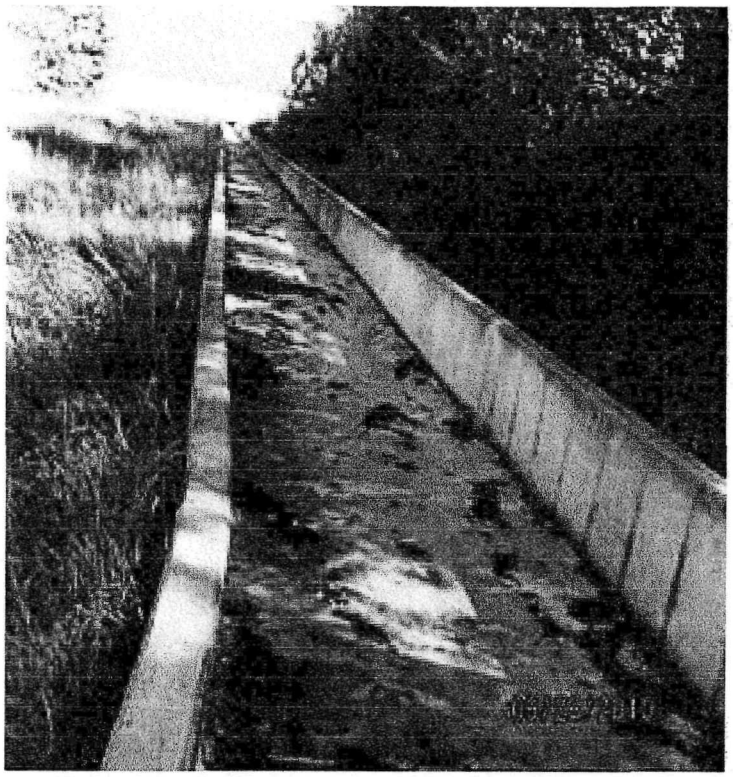
Rip Rap at Principal Spillway outlet looking Downstream



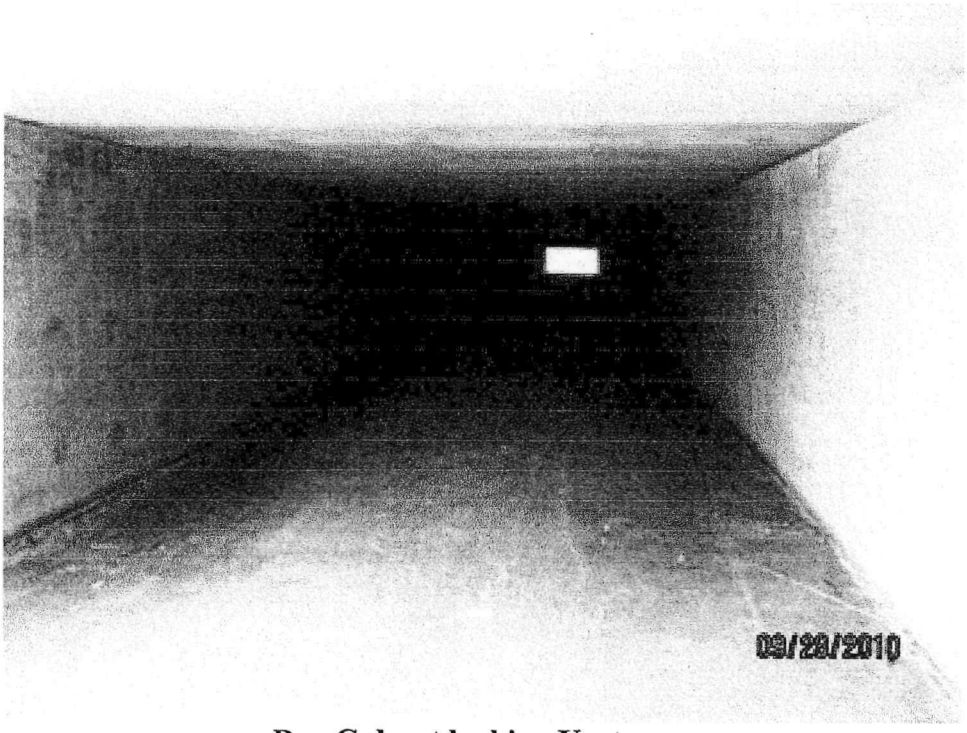
Principal Spillway Outlet



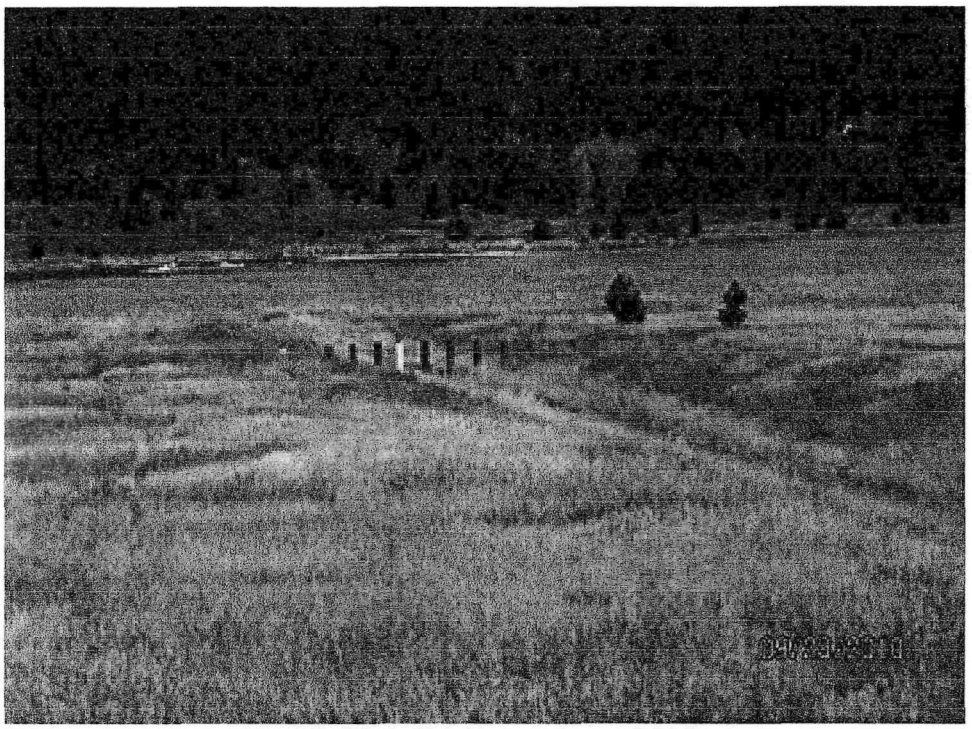
Principle Spillway looking Upstream to bend



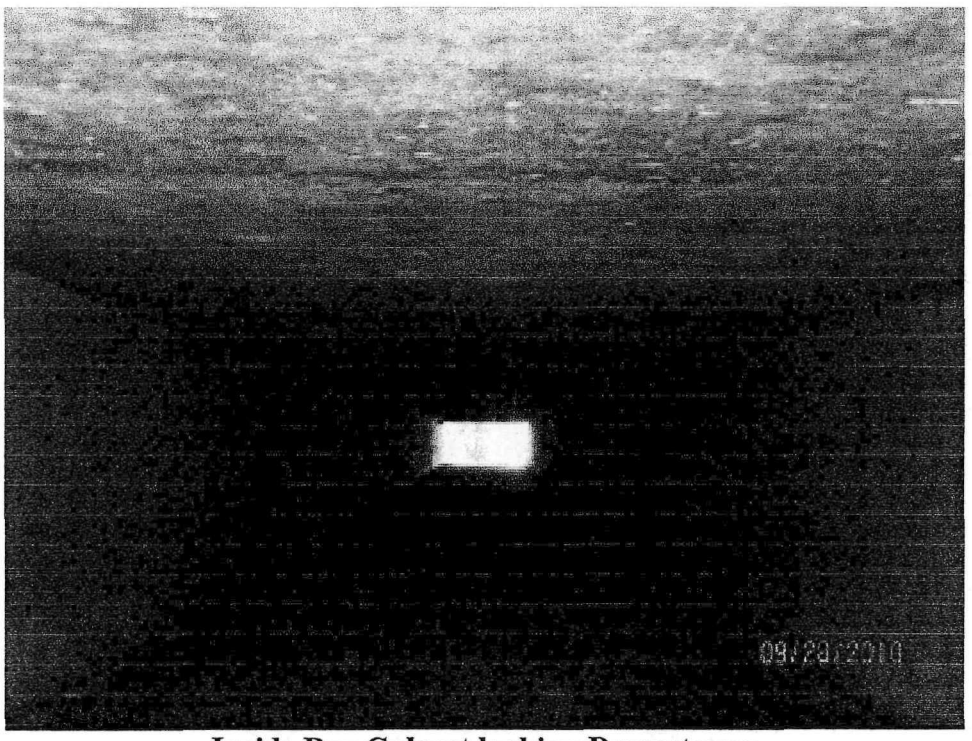
Principle Spillway at bend looking Upstream



Box Culvert looking Upstream

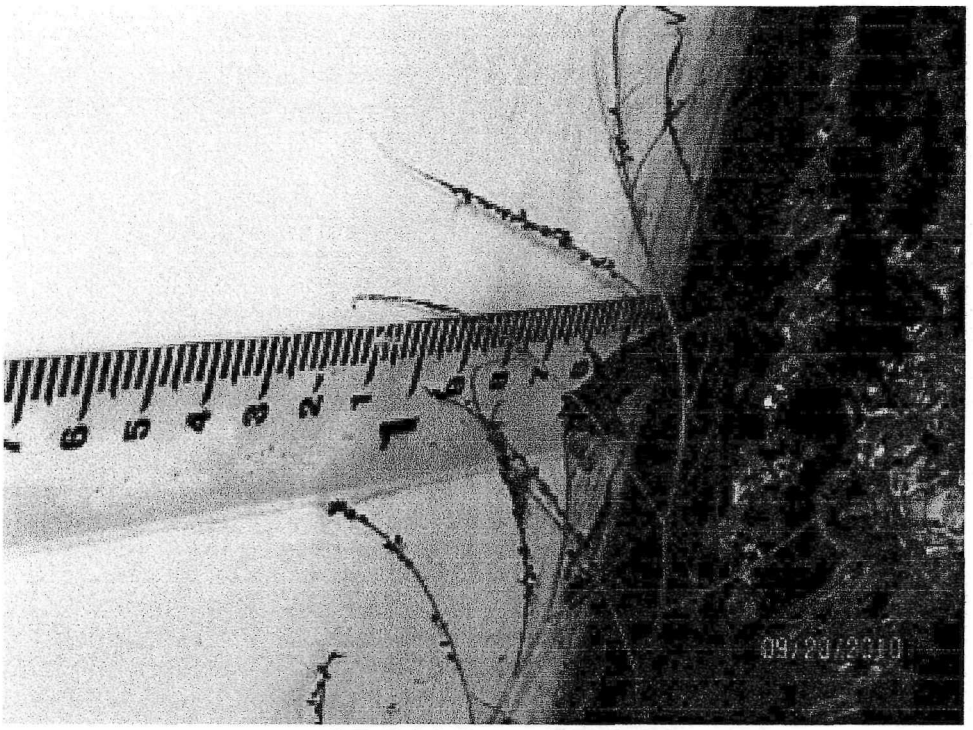


Trash Rack leading to Box Culvert

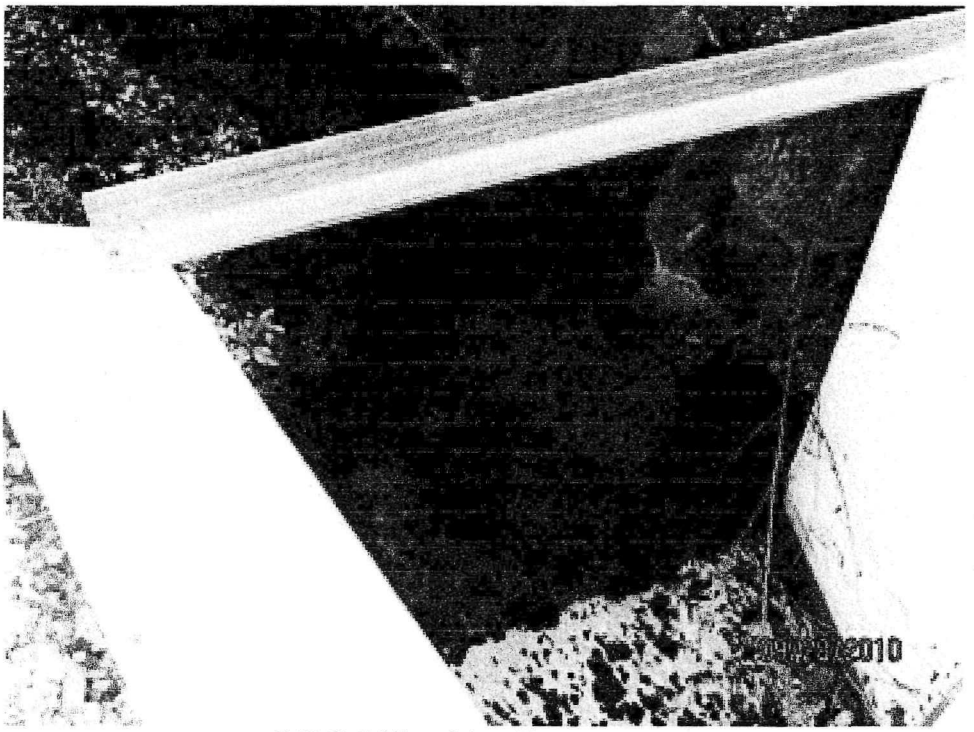


Inside Box Culvert looking Downstream

2191 Third Ave. East • P.O. Box 1139 Kalispell, MT 59903-1139 Phone: 406-257-8708 Fax: 406-257-8710



LRC-06 Gauge Height



LRC-06 Looking Downstream

2191 Third Ave. East • P.O. Box 1139 Kalispell, MT 59903-1139 Phone: 406-257-8708 Fax: 406-257-8710

APPENDIX 2

PERIODIC INSPECTION REPORT & FIELD NOTES

PRINCIPAL INSPECTOR ON SITE: Dan Nelson	*OBSERVATION DATE (S)*	*28-Sep-10*
OTHER PERSONNEL ON SITE: Jeremy Peterson from Chapman Const.	*WEATHER CONDITIONS*	*Ptly cldy, warm ~53° to 72°F there was rain last week .*
Work Tasks: Measure flow, check URC02, check Fleetwood Creek, take reservoir level, measure piezometers, check crack in box culvert, check drains, drain flow, fix and measure LRC01, gauge height at CC02 , LRC02 and LRC06	*EQUIPMENT*	*Well probe, long fiberglass tape, camera, flashlight,misc. field equip.*

EMBANKMENT

AREA INSPECTED	ITEM NO.	CONDITION	OBSERVATION	CHECK ACTION NEEDED: MONITOR	INVESTIGATE	REPAIR	OTHER
CREST	1	GENERAL SURFACE CONDITION	Good, no change				
	2	DISPLACEMENTS	None				
	3	EROSION	None				
	4	CREST ALIGNMENT	Good, no change				
	5	WEEDS OR BRUSH	No change				
	6	ANIMAL BURROWS	No change, minor				
	7	EARTHEN EMERGENCY SPILLWAY	Good, no change				
	8						
	9						
UPSTREAM FACE	10	SLIDES, DISPLACEMENT OR BUDGES	None				
	11	EROSION	None				
	12	WEEDS OR BRUSH	None				
	13	PIEZOMETER CASINGS	Good, no change				
	14	ABUTMENT CONTACTS	Good, no change				
	15	ANIMALS BURROWS	No change				
	16	DISTANCE TO WATER	~800 ft. reservoir at typical low level				
	17						
	18						
	19						

ADDITIONAL COMMENTS, REFER TO ITEM NO. IF APPLICABLE

KOOTENAI DEVELOPMENT IMPOUNDMENT DAM ROUTINE OWNERS INSPECTION REPORT

PRINCIPAL INSPECTOR ON SITE: Dan Nelson	*OBSERVATION DATE (S)*	*9/28/10*
OTHER PERSONNEL ON SITE: Jeremy Peterson from Chapman Const.	*WEATHER CONDITIONS*	*Ptly cldy, warm ~53° to 72°F there was rain last week .*
Work Tasks: Measure flow, check URC02, check Fleetwood Creek, take reservoir level, measure piezometers, check crack in box culvert, check drains, drain flow, fix and measure LRC01, gauge height at CC02 , LRC02 and LRC06	*EQUIPMENT*	*Well probe, long fiberglass tape, camera, flashlight,misc. field equip.*

AREA INSPECTED	ITEM NO.	CONDITION	OBSERVATION	CHECK ACTION NEEDED: MONITOR	INVESTIGATE	REPAIR	OTHER
		DOWNSTREAM AND INSTRUMENTATION					
DOWNSTREAM SLOPE	20	GENERAL SURFACE CONDITION	Good no change				
	21	DISPLACEMENTS	None				
	22	EROSION	None				
	23	LIFT ALIGNMENTS	Good				
	24	WEEDS OR BRUSH	No change				
	25	ANIMALS BURROWS	No change				
	26	EARTHEN EMERGENCY SPILLWAY	Good, no change				
	27	SEEPAGE	None				
	28	ABUTMENT CONTACTS	Good, no change				
INSTRUMENTATION	29	PIEZOMETERS	Measured, see attached measurements	X	X		
	30	WEIRS	Gauges read, see attached	X			
	31	FLUMES	Gauges read, see attached	X			
	32	RESERVOIR LEVELS	Read, GH down .11 ft. to 0.02 ft.	X			
	33	RAINY CREEK INFLOW MEASUREMENTS @ URC02	GH= 0.305, Increase 31 gpm since Aug.	X			
	34	RAINY CREEK OUTFLOW BELOW DAM @ LRC01	Fixed Flume from Moose damage	X			
	35	STREAM OUTFLOW BELOW MILL POND @LRC02	GH=0.31, Decrease 43 gpm since Aug.	X			
	36	STREAM OUTFLOW FROM CARNEY CREEK @CC02	Increase 31 gpm since Aug.	X			
	37	STREAM OUTFLOW FROM RAINY CREEK @LRC06	Increase 8 gpm since Aug.	X			
	38	FLUME 1-2-3-4	dropped 4 gpm	X			

ADDITIONAL COMMENTS REFER TO ITEM NO. IF APPLICABLE

KOOTENAI DEVELOPMENT IMPOUNDMENT DAM ROUTINE OWNERS INSPECTION REPORT

PRINCIPAL INSPECTOR ON SITE: Dan Nelson	*OBSERVATION DATE (S)*	*09/28/10*
OTHER PERSONNEL ON SITE: Jeremy Peterson from Chapman Const.	*WEATHER CONDITIONS*	*Ptly cldy, warm ~53° to 72°F there was rain last week .*
Work Tasks: Measure flow, check URC02, check Fleetwood Creek, take reservoir level, measure piezometers, check crack in box culvert, check drains, drain flow, fix and measure LRC01, gauge height at CC02 , LRC02 and LRC06	*EQUIPMENT*	*Well probe, long fiberglass tape, camera, flashlight,misc. field equip.*

AREA INSPECTED	ITEM NO.	CONDITION	OBSERVATION	CHECK ACTION NEEDED: MONITOR	INVESTIGATE	REPAIR	OTHER
		INSTRUMENTATION (CONT.) AND DOWNSTREAM TOE AREA					
INSTRUMENTATION (CONT.)	39	FLUME 10-11-12	Removed, no longer used				
	40	FLUME 7-8	Increase 3 gpm	X			
	41	WEIR 5	dropped slightly	X			
	42	WEIR 12	Decrease 3 gpm	X			
	43	DRAIN 6	Increase 19.8 gpm	X			
	44	SPILLWAY FLOW	None this year	X			
	45	F-Seep	dropped	X			
	46						
	47						
DOWNSTREAM TOE	48	ABUTMENTS	Good, no change				
	49	SEEPAGE NEAR TOE	None noted this year				
	50	SEEPAGE DOWNSTREAM OF TOE, LEFT SIDE	F-Seep = 0.14	X	X		
	51	SEEPAGE IN STREAM CHANNEL, LEFT SIDE	Minor to slightly wet, much less than in previous years				
	52	VEGETATION	More growth in channel and around drains. See below				
	53	CULVERT AT LOWER ROAD	Not monitored				
	54						
	55						
	56						

ADDITIONAL COMMENTS, REFER TO ITEM NO. IF APPLICABLE

Downstream Toe 52: The vegetation has already started to grow in near the toe drains this year. The additional growth is attributed to the heavy rains in late April and all of May, not to a change in the water at the toe. Weed cutting will be planned.

KOOTENAI DEVELOPMENT IMPOUNDMENT DAM ROUTINE OWNERS INSPECTION REPORT

PRINCIPAL INSPECTOR ON SITE: Dan Nelson	*OBSERVATION DATE (S)*	*09/28/10*
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Work Tasks: Measure flow, check URC02, check Fleetwood Creek, take reservoir level, measure piezometers, check crack in box culvert, check drains, drain flow, fix and measure LRC01, gauge height at CC02 , LRC02 and LRC06	*EQUIPMENT*	*Well probe, long fiberglass tape, camera, flashlight,misc. field equip.*

SPILLWAYS

AREA INSPECTED	ITEM NO.	CONDITION	OBSERVATION	CHECK ACTION NEEDED: MONITOR	INVESTIGATE	REPAIR	OTHER
PRINCIPAL SPILLWAY (BOX CULVERT AND OPEN CHANNEL CHUTE SPILLWAY)	58	ENTRANCE CONDITION	Good, no change, minor grass growth				
	59	CENTERLINE CRACK FLOOR	Checked, no visual change	X			
	60	CENTERLINE CRACK CEILING	Checked, no visual change	X	X		
	61	TRANSVERSE JOINTS	No change, same CaCo3 deposits				
	62	GENERAL CONCRETE	Good to excellent, no change				
	63	SEEPAGE OR WATER	No moisture	X			
	64	OPEN CHANNEL CONCRETE	Good to excellent, no change				
	65	OPEN CHANNEL JOINTS	Good to excellent, no change				
	66	OPEN CHANNEL GENERAL	Good				
OPEN CHANNEL STEEP CHUTE SPILLWAY	67	JOINTS	Good				
	68	WALL CONCRETE	Visual from above, good				
	69	FLOOR CONCRETE	Visual from above, good				
	70	WALL TOPS	Good				
	71	WEEDS ALONG WALLS	None noted				
	72	STILLING BASIN RIPRAP	Good				
	73	WEED AND BRUSH IN STILLING BASIN	Cleared last fall, good				
	74						
	75						
	76						

ADDITIONAL COMMENTS, REFER TO ITEM NO. IF APPLICABLE

KOOTENAI DEVELOPMENT IMPOUNDMENT DAM ROUTINE OWNERS INSPECTION REPORT

PRINCIPAL INSPECTOR ON SITE: Dan Nelson	*OBSERVATION DATE (S)*	*9/28/10*
OTHER PERSONNEL ON SITE: Jeremy Peterson from Chapman Const.	*WEATHER CONDITIONS*	*Ptly cldy, warm ~53° to 72°F there was rain last week .*
Work Tasks: Measure flow, check URC02, check Fleetwood Creek, take reservoir level, measure piezometers, check crack in box culvert, check drains, drain flow, fix and measure LRC01, gauge height at CC02 , LRC02 and LRC06	*EQUIPMENT*	*Well probe, long fiberglass tape, camera, flashlight,misc. field equip.*

AREA INSPECTED	ITEM NO.	RESERVOIR AND UPSTREAM DRAINAGE BASIN CONDITION	OBSERVATION	CHECK ACTION NEEDED MONITOR	INVESTIGATE	REPAIR	OTHER
RESERVOIR	77	LEFT SIDE (TAILINGS SLOPE)	Stable				
	78	RIGHT SIDE	Stable				
	79	RESERVOIR LEVEL	receding.	X			
	80	WETLANDS	Good, no change				
	81	UPPER POND	Full, no change				
	82	DISTANCE FROM UPSTREAM SLOPE	~ 800 ft. typical low reservoir level	X			
	83						
	84						
	85						
UPSTREAM DRAINAGE BASIN	86	PRECIPITATION WY 2009-2010 AS OF DATE OF INSP.	Low, 83% of normal	X			
	87	RECENT RAINS	Significant rains throughout much of May and June. Some rain in July but not as much, now drier than ususal	X			
	88	FIRE DANGER	None				
	89	CHANGES	None				
	90	VEGETATION	No change				
	91	RAINY CREEK DRAINAGE	No change				
	92	FLEETWOOD CREEK DRAINAGE	No change				
	93	MINE SITE	No change, continuing to haul from Libby.				
	94						
	95						

ADDITIONAL COMMENTS, REFER TO ITEM NO. IF APPLICABLE

KOOTENAI DEVELOPMENT IMPOUNDMENT DAM ROUTINE OWNERS INSPECTION REPORT

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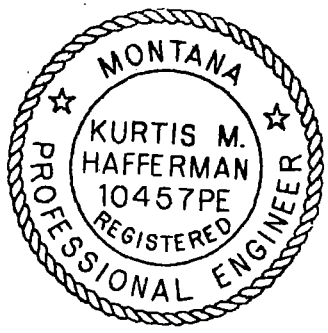
AREA INSPECTED	ITEM NO.	CONDITION	OBSERVATION	CHECK ACTION NEEDED: MONITOR	INVESTIGATE	REPAIR	OTHER
		EARTHEN SPILLWAY AND MILL POND AND OTHER					
EARTHEN SPILLWAY	96	LEFT SIDE NEXT TO CREST	Good, no change				
	97	RIGHT SIDE	Good, no change				
	98	RESERVOIR LEVEL	Low, minimum level - Below Guage				
	99	RIPRAP	Good, no change				
	100	ROAD CONDITION	Good, no change				
	101	DOWNSTREAM SLOPE	Good, no change				
	102						
	103						
	104						
MILL POND	105	CREST	Good				
	106	UPSTREAM FACE	Good				
	107	DOWNSTREAM FACE	Good				
	108	SPILLWAY FLOW	Low flow in spillway this year				
	109	RIPRAP IN SPILLWAY	Good, no change				
	110	ANIMALS ON EMBANKMENT	Same as last month, gophers on embankment	X			
	111	ANIMALS IN SPILLWAY	No, beaver not present				
	112	RESERVOIR LEVEL	Low	X			
OTHER	113	Animals Monitoring	Same as last month, gophers on embankment	X			

ADDITIONAL COMMENTS, REFER TO ITEM NO. IF APPLICABLE

Engineers Certification and Seal

I declare that the data collection and completion of this report titled the September 2010 Routine Owners Inspection Report for the Kootenai Development Impoundment Dam, known as the subject property was completed under my direction. This assessment has revealed the conditions discussed in the inspection form in connection with the property. I declare that the statements made in this report are true to the best of my belief and professional knowledge.



10-22-2010

Kurtis M. Hafferman, P.E. MT PE 10457 Date

SEPT. 18, 2020

R-56.1

POTENTIAL IMPOUNDMENT

DAM

MONTHLY INSPECTION

JEREMY/DAN

PARTLY CLOUDY 53°

CC-02 50° - TEMP

GH = 0.15'

CLEAR

GH 0.15' - METER

RESERVOIR 58° - TEMP

LEVEL BELOW GUAGE

ESTIMATE GH = 0.02

UPPER RC-02 46° - TEMP

GH = ~~0.55'~~ 0.305

CLEAR

FLOODWOOD CREEK (POOL) - 48° - TEMP

GH 0.10

1ST FLOWS BELOW DAM - SEEP

GH 0.14' 48° - TEMP

~~LRC-01~~ SEEP BELOW DAM

PRIOR GH 0.55'

AFTER GH 0.66

LRC-02

GH 0.31'

LRC-06

GH - 0.38' 52° - TEMP

ARROWS

1 - DRY

2 - DRY

3 - CLEAR & STEADY, LOW FLOW

4 - CLEAR STEADY, LOW FLOW

FLOWS 1 TO 4 GH 0.14 51°

V - WATER 5 - HEAVY GROWTH 3/8"

DRAIN 6 - 11 1/4" CLEAR STEADY 50°

7 & 8 GH 0.13' 49° STEADY CLEAR

DRAIN 7 SEEP BELOW DRAIN

DRAIN 9 - CLEAR STEADY 51°

DRAIN 10 & 11 CLEAR STEADY 52°

DRAIN 12 V-WEIR 2 3/8" 51° SOME VEGETATION

CLEAR STEADY

PEZIOMETERS

P[illegible]-DRY

P1 - DRY

P2 - ~~127'~~ 122.6' PER JEREMY DAW

P3 - DRY

P4 - DRY

P5 - DRY

PM6 - DRY

PM2 - 104.4'

PM5 - DRY

PM4 - DRY

PM3 - DRY

PM1 - 53.15'

A8 - 8.34'

A11 - DRY

A10 - DRY

A9 - DRY

APPENDIX 3

UPDATED PIEZOMETER DATA AND GRAPHS

From S:\DOCUMENT\JOB FILES\Jobs\R\R_56_01\Documents\Annual Inspection\PIEZOMETERS

Billmayer Engineering
Kootenai Development Impoundment Dam Annual Inspection
30-Sep-10 Last Update
Hafferman **Bold = Interpolated values**
Wet Piezometer Plots

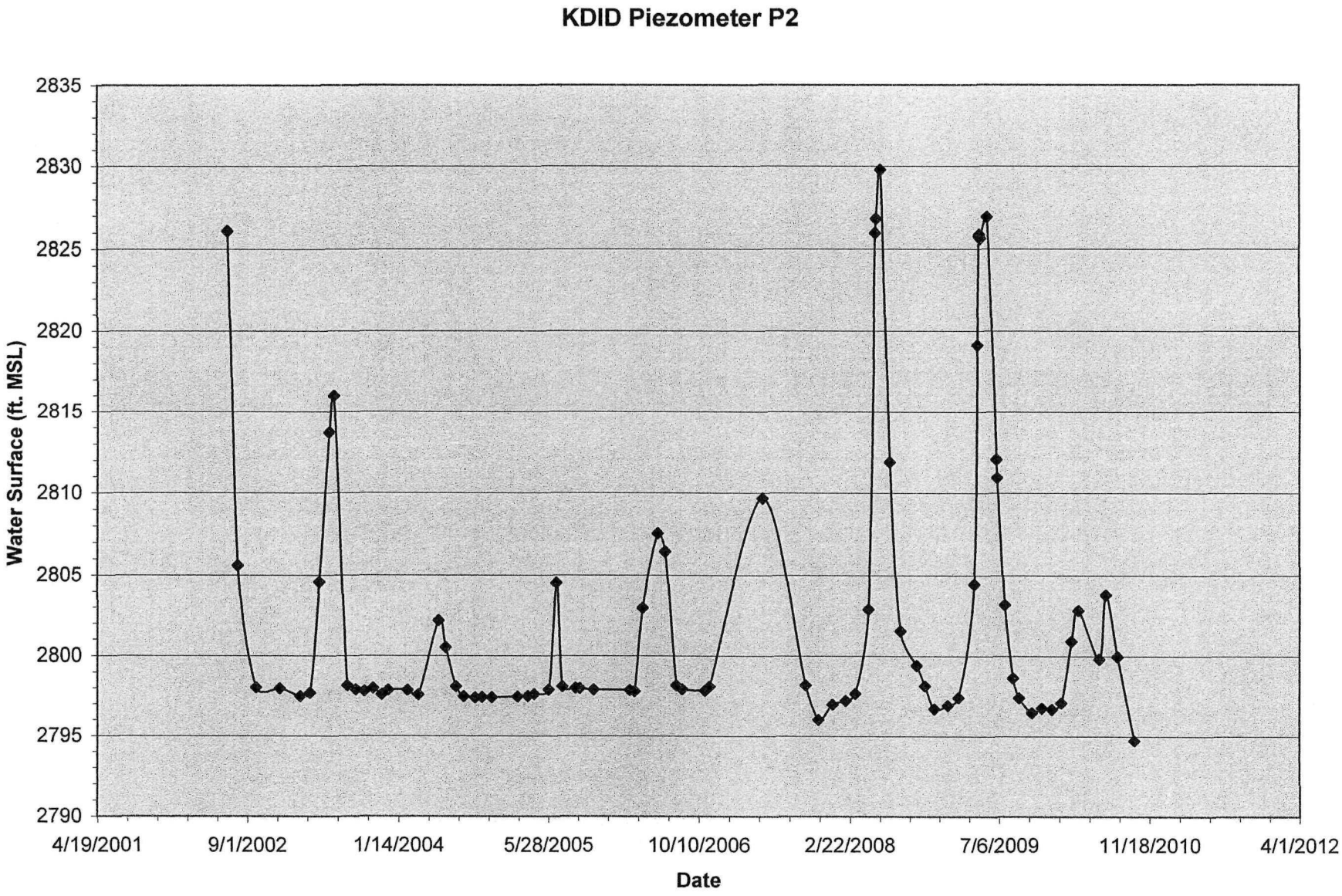
Piezometer Num	P2		Elev.	PM1		Elev.	PM2		Elev.	A8		Elev.
			G.S.= 2917.321			G.S.= 2845.852			2915.04			G.S.= 2792.7
Date	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev
9/28/2010	122.6	122.1	2794.721	53.15	54.8	2792.702	104.4	104.6	2810.64	8.34	28.3	2784.36
8/2/2010	117.35	122.1	2799.971	52.15	54.8	2793.702	102.3	104.6	2812.74	6.96	28.3	2785.74
6/25/2010	113.52	122.1	2803.801	51.41	54.8	2794.442	100.67	104.6	2814.37	6.75	28.3	2785.95
6/3/2010	117.5	122.1	2799.821	52.44	54.8	2793.412	102.27	104.6	2812.77	7.4	28.3	2785.30
3/26/2010	114.49	122.1	2802.831	53.39	54.8	2792.462	103.62	104.6	2811.42	8.19	28.3	2784.51
3/3/2010	116.42	122.1	2800.901	52.25	54.8	2793.602	102.2	104.6	2812.84	7.37	28.3	2785.33
1/29/2010	120.24	122.1	2797.081	53.65	54.8	2792.202	104.6	104.6	2810.44	8.32	28.3	2784.38
12/29/2009	120.64	122.1	2796.681	53.74	54.8	2792.112	104.28	104.6	2810.76	8.37	28.3	2784.33
11/25/2009	120.56	122.1	2796.761	53.71	54.8	2792.142	104.25	104.6	2810.79	8.31	28.3	2784.39
10/23/2009	120.85	122.1	2796.471	53.81	54.8	2792.042	104.22	104.6	2810.82	8.30	28.3	2784.40
9/11/2009	119.91	122.1	2797.411	53.69	54.8	2792.162	103.39	104.6	2811.65	8.2	28.3	2784.50
8/21/2009	118.67	122.1	2798.651	53.42	54.8	2792.432	102.18	104.6	2812.86	7.66	28.3	2785.04
7/24/2009	114.13	122.1	2803.191	52.07	54.8	2793.782	100.41	104.6	2814.63	6.42	28.3	2786.28
6/29/2009	106.36	122.1	2810.961	50.73	54.8	2795.122	97.52	104.6	2817.52	4.75	28.3	2787.95
6/26/2009	105.24	122.1	2812.081	50.6	54.8	2795.252	97.24	104.6	2817.8	4.565	28.3	2788.14
5/27/2009	90.4	122.1	2826.921	45.62	54.8	2800.232	89.6	104.6	2825.44	2.65	28.3	2790.05
5/5/2009	91.68	122.1	2825.641	45.71	54.8	2800.142	88.15	104.6	2826.89	3.41	28.3	2789.29
5/1/2009	91.45	122.1	2825.871	44.56	54.8	2801.292	87.52	104.6	2827.52	3.44	28.3	2789.26
4/30/2009	91.55	122.1	2825.771	44.66	54.8	2801.192	87.81	104.6	2827.23	3.48	28.3	2789.22
4/24/2009	98.18	122.1	2819.141	45.37	54.8	2800.482	92.13	104.6	2822.91	4.59	28.3	2788.11
4/13/2009	112.87	122.1	2804.451	51.43	54.8	2794.422	100.24	104.6	2814.8	6.88	28.3	2785.82
2/20/2009	119.9	122.1	2797.421	53.69	54.8	2792.162	103.75	104.6	2811.29	8.2	28.3	2784.50
1/15/2009	120.4	122.1	2796.921	53.86	54.8	2791.992	104.11	104.6	2810.93	8.3	28.3	2784.40
12/1/2008	120.61	122.1	2796.711	53.9	54.8	2791.952	104.07	104.6	2810.97	8.21	28.3	2784.49

Wet Piezometer Plots

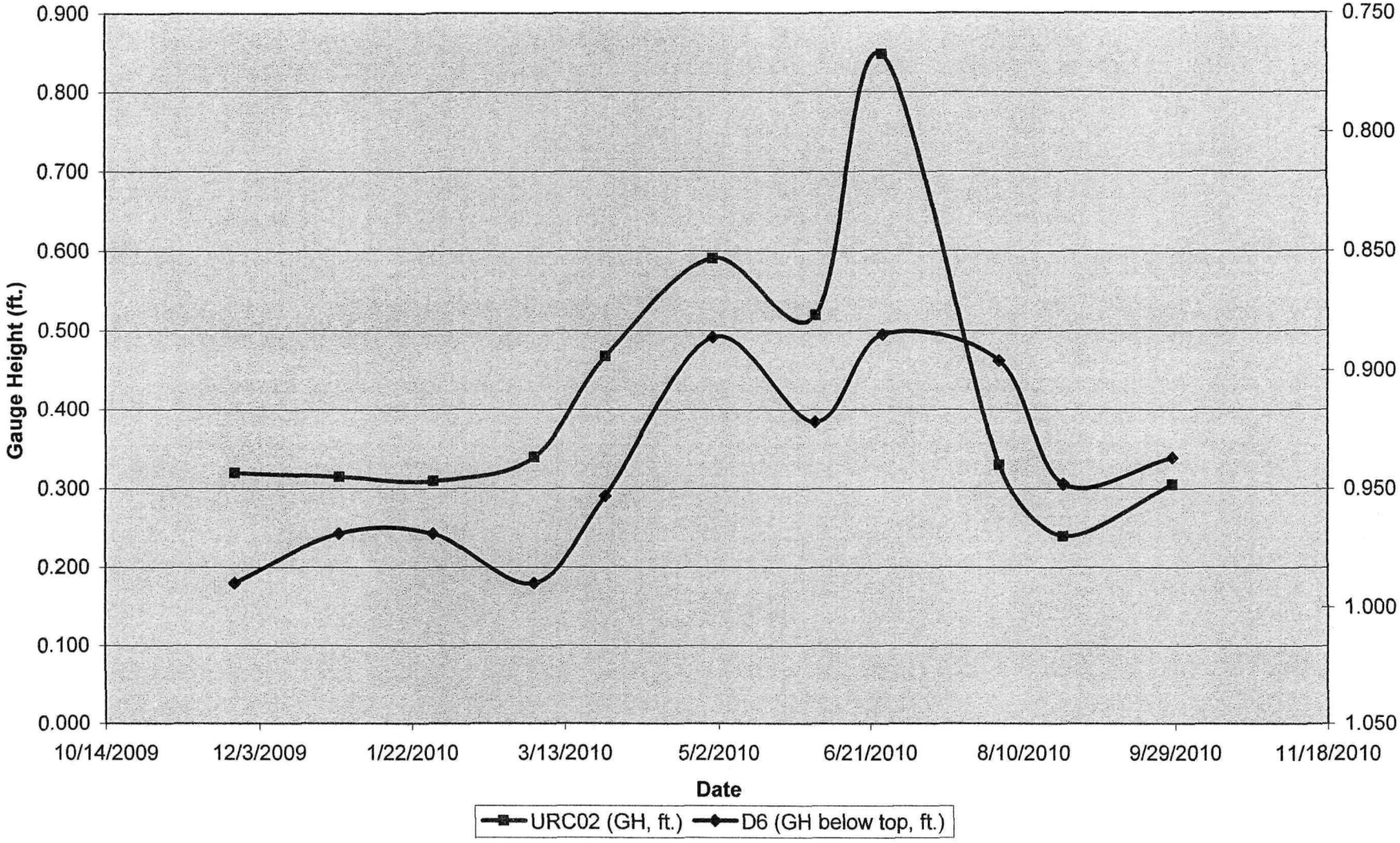
Piezometer Num	P2		Elev.	PM1		Elev.	PM2		Elev.	A8		Elev.
			G.S.= 2917.321			G.S.= 2845.852			2915.04			G.S.= 2792.7
Date	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev
10/30/2008	119.17	122.1	2798.151	53.87	54.8	2791.982	103.91	104.6	2811.13	8.18	28.3	2784.52
10/2/2008	117.9	122.1	2799.421	53.94	54.8	2791.912	104.6	104.6	2810.44	8.09	28.3	2784.61
8/8/2008	115.78	122.1	2801.541	53.12	54.8	2792.732	101.1	104.6	2813.94	6.97	28.3	2785.73
7/3/2008	105.4	122.1	2811.921	49.73	54.8	2796.122	97.49	104.6	2817.55	4.65	28.3	2788.05
6/3/2008	87.52	122.1	2829.801	48.36	54.8	2797.492	90.71	104.6	2824.33	2.93	28.3	2789.77
5/20/2008	90.49	122.1	2826.831	48.17	54.8	2797.682	88	104.6	2827.04	2.67	28.3	2790.03
5/16/2008	91.34	122.1	2825.981	46.45	54.8	2799.402	88.4	104.6	2826.64	3.88	28.3	2788.82
4/23/2008	114.42	122.1	2802.901	50.16	54.8	2795.692	101.1	104.6	2813.94	7.6	28.3	2785.10
3/10/2008	119.65	122.1	2797.671	51.47	54.8	2794.382	103.53	104.6	2811.51	8.4	28.3	2784.30
2/7/2008	120.1	122.1	2797.221	51.2	54.8	2794.652	103.8	104.6	2811.24	8.55	28.3	2784.15
12/26/2007	120.34	122.1	2796.981	51.52	54.8	2794.332	103.98	104.6	2811.06	8.52	28.3	2784.18
11/9/2007	121.3	122.1	2796.021	51.65	54.8	2794.202	104	104.6	2811.04	8.75	28.3	2783.95
9/27/2007	119.12	122.1	2798.201	51.75	54.8	2794.102	103.12	104.6	2811.92	7.22	28.3	2785.48
5/8/2007	107.64	122.1	2809.681	49.57	54.8	2796.282	96.18	104.6	2818.86	5.22	28.3	2787.48
11/14/2006	119.21	122.1	2798.111	51.88	54.8	2793.972	102.72	104.6	2812.32	7.96	28.3	2784.74
10/30/2006	119.48	122.1	2797.841	51.82	54.8	2794.032	103.69	104.6	2811.35	7.92	28.3	2784.78
8/16/2006	119.39	122.1	2797.931	51.72	54.8	2794.132	103.51	104.6	2811.53	7.72	28.3	2784.98
7/28/2006	119.14	122.1	2798.181	51.61	54.8	2794.242	103.32	104.6	2811.72	7.42	28.3	2785.28
6/21/2006	110.89	122.1	2806.431	51.23	54.8	2794.622	101.62	104.6	2813.42	6.18	28.3	2786.52
5/27/2006	109.78	122.1	2807.541	50.76	54.8	2795.092	98.92	104.6	2816.12	4.98	28.3	2787.72
4/7/2006	114.34	122.1	2802.981	51.14	54.8	2794.712	99.79	104.6	2815.25	4.96	28.3	2787.74
3/12/2006	119.52	122.1	2797.801	51.62	54.8	2794.232	103.39	104.6	2811.65	6.18	28.3	2786.52
2/24/2006	119.44	122.1	2797.881	51.95	54.8	2793.902	103.79	104.6	2811.25	7.92	28.3	2784.78
10/27/2005	119.41	122.1	2797.911	51.94	54.8	2793.912	103.76	104.6	2811.28	7.81	28.3	2784.89
9/10/2005	119.32	122.1	2798.001	51.84	54.8	2794.012	103.66	104.6	2811.38	7.76	28.3	2784.94
8/27/2005	119.3	122.1	2798.021	51.78	54.8	2794.072	103.14	104.6	2811.9	7.68	28.3	2785.02
7/14/2005	119.22	122.1	2798.101	51.74	54.8	2794.112	103.46	104.6	2811.58	7.28	28.3	2785.42
6/24/2005	112.79	122.1	2804.531	51.68	54.8	2794.172	103.29	104.6	2811.75	6.22	28.3	2786.48
5/29/2005	119.42	122.1	2797.901	50.92	54.8	2794.932	103.01	104.6	2812.03	5.91	28.3	2786.79

Wet Piezometer Plots

Piezometer Num	P2		Elev.	PM1		Elev.	PM2		Elev.	A8		Elev.
			G.S.= 2917.321			G.S.= 2845.852			2915.04			G.S.= 2792.7
Date	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev
4/10/2005	119.7	122.1	2797.621	51.72	54.8	2794.132	103.32	104.6	2811.72	5.42	28.3	2787.28
3/19/2005	119.82	122.1	2797.501	51.82	54.8	2794.032	103.49	104.6	2811.55	7.79	28.3	2784.91
2/13/2005	119.86	122.1	2797.461	51.87	54.8	2793.982	103.54	104.6	2811.5	7.86	28.3	2784.84
11/19/2004	119.9	122.1	2797.421	51.91	54.8	2793.942	103.59	104.6	2811.45	7.96	28.3	2784.74
10/17/2004	119.89	122.1	2797.431	51.84	54.8	2794.012	103.52	104.6	2811.52	7.91	28.3	2784.79
9/24/2004	119.91	122.1	2797.411	51.81	54.8	2794.042	103.49	104.6	2811.55	7.82	28.3	2784.88
8/17/2004	119.84	122.1	2797.481	51.79	54.8	2794.062	103.34	104.6	2811.7	7.79	28.3	2784.91
7/22/2004	119.21	122.1	2798.111	51.72	54.8	2794.132	103.29	104.6	2811.75	7.42	28.3	2785.28
6/18/2004	116.8	122.1	2800.521	50.69	54.8	2795.162	102.14	104.6	2812.9	7.01	28.3	2785.69
5/25/2004	115.14	122.1	2802.181	50.95	54.8	2794.902	101.34	104.6	2813.7	6.55	28.3	2786.15
3/19/2004	119.74	122.1	2797.581	51.68	54.8	2794.172	101.46	104.6	2813.58	7.8	28.3	2784.90
2/12/2004	119.45	122.1	2797.871	51.82	54.8	2794.032	103.52	104.6	2811.52	7.8	28.3	2784.90
12/10/2003	119.44	122.1	2797.881	51.86	54.8	2793.992	103.54	104.6	2811.5	7.91	28.3	2784.79
11/19/2003	119.72	122.1	2797.601	51.84	54.8	2794.012	103.59	104.6	2811.45	7.9	28.3	2784.80
10/21/2003	119.32	122.1	2798.001	51.84	54.8	2794.012	103.54	104.6	2811.5	7.94	28.3	2784.76
9/23/2003	119.51	122.1	2797.811	51.76	54.8	2794.092	103.49	104.6	2811.55	7.7	28.3	2785.00
8/26/2003	119.42	122.1	2797.901	51.62	54.8	2794.232	103.42	104.6	2811.62	7.68	28.3	2785.02
7/29/2003	119.16	122.1	2798.161	51.58	54.8	2794.272	103.38	104.6	2811.66	7.39	28.3	2785.31
6/14/2003	101.34	122.1	2815.981	50.62	54.8	2795.232	101.23	104.6	2813.81	6.22	28.3	2786.48
5/30/2003	103.62	122.1	2813.701	49.67	54.8	2796.182	94.67	104.6	2820.37	4.62	28.3	2788.08
4/28/2003	112.74	122.1	2804.581	50.02	54.8	2795.832	97.48	104.6	2817.56	3.41	28.3	2789.29
3/28/2003	119.62	122.1	2797.701	51.99	54.8	2793.862	102.91	104.6	2812.13	6.21	28.3	2786.49
2/24/2003	119.82	122.1	2797.501	52.74	54.8	2793.112	103.9	104.6	2811.14	7.62	28.3	2785.08
12/18/2002	119.34	122.1	2797.981	51.74	54.8	2794.112	103.36	104.6	2811.68	7.77	28.3	2784.93
9/30/2002	119.28	122.1	2798.041	51.55	54.8	2794.302	103.12	104.6	2811.92	7.22	28.3	2785.48
7/31/2002	111.72	122.1	2805.601	50.54	54.8	2795.312	98.87	104.6	2816.17	5.46	28.3	2787.24
6/28/2002	91.22	122.1	2826.101	48.82	54.8	2797.032	89.63	104.6	2825.41	2.62	28.3	2790.08


KDID Piezometer P2
Water Surface (ft. MSL)
2835
2830
2825
2820
2815
2810
2805
2800
2795
2790
4/19/2001
9/1/2002
1/14/2004
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
Date

KDID Inflow at Upper Rainy Creek and Drian 6 Comparision



KDID Piezometers July 1, 2002 to September 28, 2010